IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

1761

In re Patent Application of

Atty Dkt. 1232-19
C# M#

TAKEUCHI et al

Group Art Unit: 1761

Serial No. 09/440,137

Examiner: Paden

Filed: November 15, 1999

Date: December 12, 2001

Title: OIL OR FAT COMPOSITION

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12-18-01

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

RESPONSE/AMENDMENT/LETTER

This is a response/amendment/letter in the above-identified application and includes an attachment which is hereby incorporated by reference and the signature below serves as the signature to the attachment in the absence of any other signature thereon.

Fees are attached as calculated below:

Total effective claims after amendment **6** minus highest number previously paid for **20** (at least 20) = 0 x $ 18.00	$	0.00
Independent claims after amendment **1** minus highest number previously paid for **3** (at least 3) = 0 x $ 84.00	$	0.00
If proper multiple dependent claims now added for first time, add $280.00 (ignore improper)	$	0.00
Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s) ($110.00/1 month; $400.00/2 months; $920.00/3 months)	$	400.00
Terminal disclaimer enclosed, add $ 110.00	$	0.00
☐ First/second submission after Final Rejection pursuant to 37 CFR 1.129(a) ($740.00) ☐ Please enter the previously unentered , filed ☐ Submission attached	$	0.00
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TOTAL FEE ENCLOSED	$	**400.00**

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* * * * * * * * * * *

December 12, 2001

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

RESPONSE

This is responsive to the Official Action dated July 26, 2001 (for which petition is hereby made for a two month extension of time). The issues raised in the Action are addressed below in the order presented.

The change from "middle" to – medium – does not represent added subject matter

The amendment of middle-chain fatty acid to medium-chain fatty acid is merely a correction of an error in selecting an art-recognized term. Page 5, lines 16-22 of applicants' specification states "The middle-chain fatty acids in the invention are assumed to mean fatty acids, particularly saturated fatty acids, having 6 to 12 carbon atoms. As examples, there can be mentioned caproic acid, caprylic acid, capric acid and lauric acid and saturated fatty acids having 8 to 10 carbon atoms, particularly caprylic acid and capric acid are preferred."

This definition is nothing other than the art-recognized definition of medium-chain fatty acids. Further, according to ***Collins Dictionary Of The English Language***, page

974, middle is described as "4. not extreme, esp. in size; medium" or "3. located between the early and late parts of a series, time sequence, etc." Medium is described at page 958 as "1. midway between extremes; average: a *medium size*", and according to ***Longman Dictionary of the English Language***, middle is described at page 928 as "2. at neither extreme; intermediate," while medium is described at page 911 as "intermediate in amount, quality, position or degree."

From the above authorities it is apparent that middle and medium have a similar or common meaning. One skilled in the art will readily recognize that middle-chain fatty acid is an error for "**medium** chain fatty acid" from the above description of the specification alone, with reference to the attached well-recognized dictionary definitions/meanings or, in addition, the skilled reader's own understanding of the usual and customary way of reporting the chain length of a fatty acid.

As evidence of the usage of "medium-chain fatty acids" in this art please see the attached excerpt from "The Journal of Nutrition", volume 110, January-December 1980, pages 686-696. At the beginning of Abstract on page 686, it states that medium-chain fatty acids are fatty acids having 6-12 carbon atoms. See also the Babayan reference (cited and applied in the Official Action) at column 2, "medium-chain fatty acid," lines 50-51 for the definition of medium-chain fatty acids is the same as that of "middle-chain fatty acids" 6-12 carbon atoms given at page 5, lines 23-29 of the original specification. By changing "middle" to --medium-- the skilled reader of this text will be more familiar with the art-recognized terminology. The meaning is in no way changed.

The translator advises he translated" **割合** "of" **中鎖脂肪酸** "(namely, "medium" of "medium-chain fatty acid " in claim 1 (which is the same as claim 1 of the original specification of the present application) of Japanese Patent Application No. 49300/1999 (11-49300) as "middle". The application forms the basis of the claim of priority of the present application. According to "KENKYUSHA'S NEW COLLEGIATE JAPANESE-ENGLISH DICTIONARY 3rd edition"(relevant parts attached) which is a dictionary published by KENKYUSHA Co. who has the best reputation as to language dictionaries, "middling" and "medium" are mentioned as an English word corresponding

to an adjective " 中 ." This is the reason that the translator incorrectly selected the word "middle" as " 中 " of "中鎖脂肪酸" instead of medium.

The change from "rate" to "ratio" to –amount– does not represent added subject matter

The word "rate" appears as "the rate of middle-chain fatty acids in all the fatty acids composing the oil or fat composition is 5 to 23% by mass" and "the rate of triglycerides having two middle-chain fatty acid residues in the molecule in all the triglycerides is 1 to 20% by mass" in claim 1, in "the rate of triglycerides having three middle-chain fatty acid residues in the molecule in all the triglycerides composing the oil or fat composition is 3% by mass or less" in claim 3, and as "the rate of long-chain saturated fatty acids in all the long-chain fatty acids composing the oil or fat composition is 20% by mass or less" in claim 4. The word "rate" also appears in the other claims and in the specification in the same expression as above.

According to ***Collins Dictionary of the English Language***, "rate" is described at page 1269 as "1. a quantity or amount considered in relation to or measured against another quantity or amount" (while the examiner has construed the term as if rate only expresses speed or velocity, it is apparent from the above dictionary definition that rate can express amount in its broader meaning). The word "ratio" is described also on page 1269 as "a measure of the relative size of two classes expressible as a proportion."

It is apparent to the skilled reader in this art that both rate and ratio may be used interchangeably in expressing the proportion of relative amounts between two things consistent with the authority and usages given above. Rate in the present application also expresses the proportion of relative amounts between two things. For example, in the above "the rate of middle-chain fatty acids in all the fatty acids composing the oil or fat composition is 5 to 23% by mass", the rate expresses the proportion of relative amount between middle-chain fatty acids and all the fatty acids. Therefore, one skilled in the art readily understands based on such a meaning of rate that the rate of, for example, the above "the rate of middle-chain fatty acids in all the fatty acids composing the oil or fat composition is 5 to 23% by mass" expresses the meaning of ratio or merely amount. In

this connection, in the claims, specification and abstract now on file, there is no word "ratio" as a substitute of rate, and rate is wholly replaced with amount.

The translator advises he translated " 割合 " in claim 1 (which is the same as claim 1 of the original specification of the present application) of Japanese patent application No. 49300/1999 (11-49300) (the front page of the request and the claim part are enclosed) as "rate." The Japanese application is the basis of the priority claim of the present application. According to "Kenkyusha's New Japanese-English Dictionary 4th edition" (relevant parts attached) and "Kenkyusha's New Collegiate Japanese-English Dictionary 3rd edition" (relevant part attached which are dictionaries published by Kenkyusha Co. who has the best reputation as to language dictionaries), "rate" among the English words corresponding to "割合."

In summary, the amendment of middle to medium and the amendment of rate to amount (or ratio) are amendments readily understood by one skilled in the art from their use in context in the claims and specification and the dictionary definitions.

Clearly no new matter is involved. It is clear applicants had their invention directly in mind and, as disclosed in considerable detail, had possession of their invention at the priority date as well as thereafter.

Response to Art-Based Rejections

Applicants now address the three prior art-based rejections stated on pages 3 and 4 of the Action. Two of these rejections are based upon alleged anticipation under 35 U.S.C. § 102(b), thus it is appropriate to review the standards required to substantiate a rejection under this section of the patent statute.

To anticipate a claim, a single reference must disclose the claimed invention with sufficient clarity to prove its existence in the prior art. *Motorola Inc. v. Interdigital Technology Corp.*, 43 U.S.P.Q.2d 1481, 1490 (Fed. Cir. 1997). Anticipation rejections are only proper when the "claimed subject matter is identically disclosed or described in 'the prior art', without *any* need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference." *In re Arkley*, 172 U.S.P.Q. 524, 526 (CCPA 1972); *see also Akzo N.V. v. International Trade*

Commission, 1 U.S.P.Q. 2d 1241, 1246 (Fed. Cir. 1986); *Ex parte Lee,* 31 U.S.P.Q. 2d 1105, 1108 (BPAI 1993). Every element of the challenged claim must be disclosed within this single reference. *PPG Industries Inc. v. Guardian Industries Corp.,* 37 U.S.P.Q.2d 1618, 1624 (Fed. Cir. 1996). Absence from the reference of any claimed element negates anticipation *Kloster Speedsteel AB v. Crucible Inc.* 23 U.S.P.Q. 160 (Fed. Cir. 1986).

According to Office Action, the Examiner argues that "Claims 9, 10, 11 and 14 are rejected under 35 U.S.C. §102 (b) as being clearly anticipated by El-Nokaly (5,192,572) and see column 4, lines 23-40."

El-Nokaly claims a process for lowering the fat absorption of fried potato pieces by frying potato pieces in an oil comprising 0.1-2 % by weight silica and 98-99.9 % by weight oil. The silica is a hydrophilic silica with a particle size of 7-100,000 nm (claim 1). Column 4, lines 23-40, referred to by the Examiner, describes as one of oils preferred to be used in the above process, reduced calorie fats comprising at least 15 % by weight triglycerides selected from the group consisting of MML, MLM, LLM and LML triglycerides (M: C6-C10 saturated fatty acids, L: C16-C26 saturated fatty acids) and mixtures thereof.

The invention of claim 9 of the present application relates to an oil or fat composition composed chiefly of triglycerides, and the characterizing parts include (1) the amount of medium-chain fatty acids in all the fatty acids composing the oil or fat composition is 5 to 23 % by mass, (2)the amount of triglycerides having two medium-chain fatty acid residues in the molecule in all the triglycerides is 1 to 20 % by mass, and (3) the amount of long-chain saturated fatty acids in all the long-chain fatty acids composing the oil or fat composition is 20 % by mass or less. Therefore, in order to anticipate the invention of claim 9, all of the above (1), (2), and (3) must be disclosed in the reference cited. El-Nokaly fails to provide a disclosure meeting these high standards for establishing anticipation.

Assuming that the oil of El-Nokaly referred to by the Examiner is a fat containing 15 % by weight triglycerides consisting of MML and MLM, the oil may fall within the

scope of item (2) of the invention of claim 9 of the present application. However, as to whether the oil of El-Nokaly referred to by the Examiner meets requirements (1) and (3), there is no disclosure in El-Nokaly stating or suggesting either of these two essential requirements. Requirement (1) of the present invention defines a proportion between certain fatty acids constituting the composition, namely the proportion of medium-chain fatty acids to all the fatty acids composing the oil or fat composition. This proportion cannot be located or derived from the oil of El-Nokaly referred to by the Examiner which merely requires a proportion between triglycerides. The reason is that in the oil of El-Nokaly referred to by the Examiner the contents of the residual 85 % by weight or less oil is not disclosed. Further, item (3) of the invention of claim 9 of the present application also requires a proportion between certain fatty acids constituting the composition, namely the proportion of long-chain saturated fatty acids to all the long-chain fatty acids composing the oil or fat composition. This proportional relationship cannot be derived from the oil of El-Nokaly referred to by the Examiner as the reference merely defines the proportion between triglycerides. The reason is that in the oil of El-Nokaly referred to by the Examiner, the constitution of the residual 85 % by weight or less oil remains unclear.

Therefore, the invention of claim 9 of the present application cannot be anticipated by El-Nokaly, and the inventions of claims 10 and 11 dependent to claim 9 and the invention of claim 14 using the composition of claim 9 as a component are not anticipated by El-Nokaly. The rejection under §102(b) based on El-Nokaly is not supportable and must be withdrawn.

In the Office Action, the Examiner argues "Claims 9, 10, 11 and 14 are rejected under 35 U.S.C. § 102 (b) as anticipated by or, in the alternative, under 35 U.S.C. § 103 (a) as obvious over Babayan in the light[1] of Gunstone".

The Examiner asserts the reason is "Babayan discloses a structured lipid containing dairy fat. The structured lipid ("the fat" referred to by the Examiner is

[1] As only a single reference may be relied upon for anticipation (see *PPG Industries* discussed above) the combination here asserted can only be applied under 35 U.S.C. § 103(a).

probably incorrect in applicants' view) is made by the random transesterification of (a pre-transesterification mixture consisting of) 35-40 % (by weight) medium-chain triglycerides and 50-60 % (by weight) dairy fat. There is no specific suggestion that the composition contains the triglycerides with two MCT but this feature would be expected to result from the random transesterification of the oils (note Gunstone at page 145 for support of this assertion). Also butterfat and dairy fat are known to contain a substantial amount of long chain fatty acids (note Gunstone at page 24)."A closer look at the applied references will reveal the Examiner is mistaken.

According to column 2, line 12 of Babayan, when the pre-transesterification mixture contains 35 % by weight medium-chain triglycerides and 50 % by weight dairy fat, the residue is composed of polyunsaturated long-chain triglycerides.

In order for a single cited reference to anticipate application of Article 102, it is necessary that (1) the description of the cited reference must be made so that the subject matter of the relevant claim can be practiced and used by one skilled in the art, and (2) the subject matter of the relevant claim must be described identically in the cited reference

However, not only Babayan itself but Babayan considered in the light of Gunstone still does not describe the requisites of the above-discussed (1), (2) and (3) of the invention of claim 9 of the present application identically. A determination of whether or not the cited references meet the requisites of the above (1), (2) and (3) of the present invention cannot be made without a number of suppositions. On the suppositions, for example, the Examiner says that the equations of page 145 of Gunstone can be used for the composition of a product by random transesterification. This is not so because these equations are for transesterification between trisaturated glycerides (GS_3) and triunsaturated glycerides (GU_3). On the basis of the present record it is uncertain whether they can also be extrapolated and used for calculation of the requisite of the above (2), namely "the amount of triglycerides having two medium-chain fatty acid residues in the molecule in all the triglycerides" of the present invention. The reason is that the mixture of Babayan before transesterification usually consists of three components and further,

the diary fat, which is one of the three components, contains both saturated fatty acids and unsaturated fatty acids as its constituents. Further, as apparent from the following discussions (a) to (c) on whether the composition of Babayan meets the above requisites, a determination cannot be made without a number of suppositions.

Under these circumstances, it is highly doubtful that the references cited by the Examiner establish that one skilled in the art could practice the combined teachings and/or the subject matter of the relevant claims is identically disclosed in either of the cited references.

Although, as explained above, it is highly doubtful whether the references cited by the Examiner are appropriate, assuming *arguendo* they are appropriate, applicants examined whether the structured lipid of Babayan pointed out by the Examiner meets the features of the above (1) and (2) of claim 9 of the present application. As a result, applicants have determined, as explained below, that the structured lipid of Babayan **does not** meet features of the above (1) and (2). The details of the analysis are stated below, but many assumptions had to be made to proceed with the review. For example, the Examiner says that the equation of page 45 of Gunstone can be used on the composition of a product prepared by random transesterification, but to use of the equation, it was necessary to assume that the equation on a two-component system can also be used on a three-component system and, further, that it is possible to replace the trisaturated glycerides (GS_3) and the triunsaturated glycerides (GU_3) of the equation of Gunstone with medium-chain triglycerides and dairy fat plus polyunsaturated long-chain triglycerides, respectively.

(a) As to the feature of the above (1) of the invention of claim 9 of the present application, namely that the amount of medium-chain fatty acids in all the fatty acids composing the oil or fat composition is 5 to 23 % by mass, applicants determined whether the above composition of Babayan meets this. The feature of the above (1) relates to the proportion between certain fatty acids constituting the oil or fat composition—the proportion is constant regardless whether before or after the transesterification. Therefore, whether the above composition of Babayan meets the

feature of the above (1) of the present invention can be judged based on the above pre-transesterification mixture. Among the pre-transesterification mixture of Babayan, consideration is made on a mixture, having the least proportion of medium-chain triglycerides, consisting of 35 % by weight medium-chain triglycerides, 50 % by weight dairy fat and 15 % by weight polyunsaturated long-chain triglycerides (hereinafter referred to as pre-transesterification mixture A).

Since among the medium-chain triglycerides, that having the least proportion of medium-chain fatty acids is the one whose constitutive fatty acids having 6 carbon atoms (i.e., hexanoic acid; molecular weight 116.16). The molecular weight of glycerol is 92.10. Therefore, the proportion of medium-chain fatty acids in the medium-chain triglycerides is $\{(116.16-17.01)\times3/[(116.16-17.01)\times3+(92.10-1.01\times3)]\}\times100=76.96$ % by weight. In the above equation "17.01" is the molecular weight of a hydroxyl group, and "1.01" is atomic weight of hydrogen. Therefore, the proportion of medium-chain fatty acids originating in the medium-chain triglycerides in the pre-transesterification mixture A is $35\times0.7696=26.94$ % by weight.

As for the dairy fat, three examples are mentioned as "Cow (milk)"in Table of page 24 of Gunstone. Among them the one having the least content of medium-chain fatty acids is clearly the dairy fat of No. 1. The average molecular weight of the total fatty acids constituting the dairy fat of No. 1 is [256.43 (molecular weight of palmitic acid)×36+284.48×15+282.47×21+280.45×1+88.11×5+116.16×3+144.21×1+172.27×3+200.32×3+228.38×11+254.41×3]/102=245.46, and in it the average molecular weight of all the medium-chain fatty acids is (116.16×3+144.21×1+172.27×3+200.32×3)/10=161.05. In the above, "102" and"10"are the totals of the content of each fatty acid, respectively. Therefore, the proportion of all the fatty acids in the dairy fat is $\{(245.46-17.01)\times3/[(245.46-17.01)\times3+(92.10-1.01\times3)]\}\times100=88.50\%$ by weight, and the proportion of all the medium-chain fatty acids in the dairy fat is $(10/102)\times\{(161.05-17.01)\times3/[(161.05-17.01)\times3+(92.10-1.01\times3)]\}\times100=8.13$ % by weight. Therefore, the proportion of all the fatty acids originating in the dairy fat in the

pre-transesterification mixture A is 50×0.8850=44.25 % by weight, and the proportion of all the medium-chain fatty acids originating in the dairy fat in the pre-transesterification mixture A is 50×0.0813=4.07 % by weight.

The polyunsaturated long-chain triglycerides are described in column 2, line 58 to column 3, line 1, of Babayan, but there is no statement on carbon number. Therefore, a supposition that the polyunsaturated long-chain triglyceride is sunflower oil exemplified in the above passage and used in Example 2 is made, and under this supposition the amount of fatty acids contained in the polyunsaturated long-chain triglyceride is calculated. The composition of sunflower oil is described in Table 2 of Babayan. Using this, the average molecular weight of all the fatty acids constituting the polyunsaturated long-chain triglycerides is calculated as [228.38-(molecular weight of myristic acid)×0.1 +256.43×7.6+284.48×4.2+282.47×22.3+280.45×63.8+278.44×0.9+340.59×1.1]/100=279 .84. In this connection, "others" in Table 2 of Babayan were assumed to be behenic acid (molecular weight 340.59). Therefore the proportion of all the fatty acids in the polyunsaturated long-chain triglycerides is {(279.84-17.01)×3/[(279.84-17.01)×3+(92.10-1.01×3)]}=89.85 % by weight. Therefore, the proportion of all the fatty acids originating in the polyunsaturated long-chain triglycerides in the pre-transesterification mixture A is 15×0.8985=13.48 % by weight.

This means the proportion of medium-chain fatty acids in all the fatty acids composing the pre-transesterification mixture A is [(26.94+4.07)/(26.94+44.25+13.48)]×100=36.62 % by weight (=36.62 % by mass). As mentioned above, this proportion ought to remain unchanged after the transesterification.

This value is far out of the range of the above (1) of the present invention (namely the amount of medium-chain fatty acids in all the fatty acids composing the oil or fat composition being 5 to 23 % by mass). Therefore, the structured lipid of Babayan does not anticipate the inventions of the present claims 9, 10, 11 and 14.

(b) Since Babayan shows specific examples of the structured lipid in Tables 1 and 2, examination is made for completion of the record on whether these meet the range of the above (1) of the present invention. In Table 1, Type I Dairy Fat is the structured

lipid, and the proportion of medium-chain fatty acids in all the fatty acids composing Type I Dairy Fat is 0.5+23.7+13.1+2.5=39.8 % by weight (=39.8 % by mass). In Table 2, Type II Modified Fat is the structured lipid, and the proportion of medium-chain fatty acids in all the fatty acids composing Type II Modified Fat is 0.8+22.0+12.9+2.3=38.0 % by weight (=38.0 % by mass). These values are far out of the range of the (1) of the present invention, namely, the amount of medium-chain fatty acids in all the fatty acids composing the oil or fat composition being 5 to 23 % by mass. Therefore, neither Type I Dairy Fat nor Type II Modified Fat shown in Babayan as a specific example anticipates the invention of claim 9 of the present application.

(c) As explained above, the structured lipid of Babayan does not meet the feature of (1), and, thus, the invention of claim 9 of the present application is not anticipated by Babayan. However, for completion of the record, as to the feature (2) of the present invention, namely that the amount of triglycerides having two medium-chain fatty acid residues in the molecule in all the triglycerides is 1 to 20 % by mass, applicants determined whether the composition of Babayan satisfies this. Consideration is given to the case where the mixture consisting of 35 % by weight medium-chain triglycerides, 50 % by weight dairy fat and 15 % by weight polyunsaturated long-chain triglycerides (namely, the pre-transesterification mixture A), the mixture having the least content of medium-chain triglycerides, among the compositions pointed out by the Examiner is transesterified.

Medium-chain triglycerides having the lowest mole number among the ones having a fixed weight are ones having C12 medium-chain fatty acid residues, and therefore, the medium-chain triglycerides in the pre-transesterification mixture A is assumed to be glyceryl trilaurate. The molecular weight of glyceryl trilaurate is 639.00.

As examples of dairy fat, three examples are mentioned as Cow (milk) in page 24 of Gunstone. Among them, the dairy fat having the lowest content of medium-chain fatty acids is apparently that of No. 1. Therefore, the dairy fat in the pre-transesterification mixture A is supposed to be that of No. 1. The average molecular weight of all the fatty acids composing the dairy fat of No. 1 is

[256.43 (molecular weight of palmitic acid) ×36+284.48×15+282.47×21+280.45×1+88.11×5+116.16×3+144.21×1+172.27×3+200.32×3+228.38×11+254.41×3] /102=245.46 (wherein"102" is the total of the content of each constitutive fatty acid). Therefore, the average molecular weight of the dairy fat of No. 1 is (245.46-17.01)×3+(92.10-1.01×3)=774.42. In the equation, "17.01" is the molecular weight of a hydroxyl group, "1.01" is the atomic weight of a hydrogen atom, and "92.10" is the molecular weight of glycerol.

As to polyunsaturated long-chain triglycerides, see the description in column 2, line 58 to column 3, line 1 of Babayan, but again there is no prescription on the carbon number. It is only sunflower oil that is mentioned as an example of the polyunsaturated long-chain triglycerides in the above-mentioned passage and used in examples in Babayan. Therefore, it will be reasonable to assume the polyunsaturated long-chain triglycerides in the pre-transesterification mixture A to be sunflower oil. The composition of sunflower oil is described in Table 2 of Babayan. Using this, the average molecular weight of all the fatty acids composing the polyunsaturated long-chain triglycerides is [228.38 (molecular weight of myristic acid)×0.1+256.43×7.6+284.48×4.2+282.47×22.3+280.45×63.8+278.44×0.9+340.59×1.1] /100=279.84 (in it, "others" in Table 2 of Babayan are supposed to be behenic acid). Therefore, the average molecular weight of sunflower oil is (279.84-17.01)×3+(92.10-1.01×3)=877.56.

From the above (average) molecular weights of the medium-chain triglycerides, the dairy fat and the polyunsaturated long-chain triglycerides, the contents in mole of the medium-chain triglycerides, the dairy fat and the polyunsaturated long-chain triglycerides in the pre-transesterification mixture A are calculated as follows, respectively:

Molar content of the medium-chain triglycerides:
{(35/639.00)/[(35/639.00)+(50/774.42)+(15/877.56)]}×100=40.15 % by mole

Molar content of the dairy fat:
{(50/774.42)/[(35/639.00)+(50/774.42)+(15/877.56)]}×100=47.32 % by mole

Molar content of the polyunsaturated long-chain triglycerides: {(15/877.56)/[(35/639.00)+(50/774.42)+(15/877.56)]}×100=12.53 % by mole.

When S=40.15 % by mole and U=47.32 % by mole+12.53 % by mole=59.85 % by mole are put in the equation in page 145 of Gunstone, GS_2U is calculated as 3×(S×S×U/10,000)=28.94 % by mole. This value indicates the proportion in mole of triglycerides having two medium-chain fatty acid residues, originating in the medium-chain triglycerides, in the product obtained by transesterification of the pre-transesterification mixture A (hereinafter referred to as the transesterification product).

This value in % by mole is converted again into a value in % by weight. Two of the fatty acids composing GS_2U are lauric acid (molecular weight 200.32). The last fatty acid is a fatty acid having the average molecular weight of all the fatty acids composing the dairy fat and the polyunsaturated long-chain triglycerides in the pre-transesterification mixture A.

The average molecular weight of the fat as the total of the dairy fat and the polyunsaturated long-chain triglycerides is 774.42×[0.4732/(0.4732+0.1253)]+877.56×[0.1253/(0.4732+0.1253)]=796.01. When the molecular weight of the fatty acids composing this fat is put as m, the following equation applies: (m-17.01)×3+(92.10-1.01×3)=796.01, and from this, m is 252.66. This is the molecular weight of the last fatty acid composing GS_2U.

Therefore, the molecular weight of GS_2U is (200.32-17.01)×2+(252.66-17.01)+(92.10-1.01×3)=691.34.

The average molecular weight of the transesterification product must be identical to the average molecular weight of the pre-transesterification mixture A for the reasons explained above. The average molecular weight of the pre-transesterification mixture A is 639.00 (molecular weight of glyceryl trilaurate)×0.35+774.42 (average molecular weight of the dairy fat)×0.50+877.56 (average molecular weight of the polyunsaturated long-chain triglycerides)×0.15=742.49.

Therefore, the proportion in % by weight of GS_2U, namely triglycerides having two medium-chain fatty acid residues in the molecule, originating in the medium-chain triglycerides, in the transesterification product is {[28.94 (% by mole)×691.34]/[100 (% by mole)×742.49]}×100=26.95 % by weight (=26.95 % by mass).

Since in fact the dairy fat also contains a small amount of medium-chain fatty acids (see "Cow (milk) of Table in page 24 of Gunstone), the proportion of triglycerides having two medium-chain fatty acid residues in the molecule, in the transesterification product is somewhat larger than the above calculated value. Anyway, the above value of 26.95 % by mass is far out of the requisite range of the above (2) of the present invention of claim 9 (the amount of long-chain saturated fatty acids in all the long-chain fatty acids composing the oil or fat composition being 20 % by mass or less). Therefore, the fatty acid content of Babayan does not anticipate the inventions of claims 9, 10, 11 and 14 of the present application.

From the foregoing, the rejection of claims 9, 10, 11 and 14 of the present application under 35 U.S.C. § 102 (b) as anticipated by Babayan in the light of Gunstone not supportable as the combined references do not disclose requirement (3) of claim 9.

Babayans' object is to provide a composition for nutrition support of hypercatabolic patients, for example patients following surgery (column 1, lines 43-50), whereas the object of the invention of claim 9 of the present application is in providing an edible oil or fat composition which is less accumulated as body fat (page 6, lines 18-27) and has good stability at low temperature (page 7, lines 8-16). Therefore, since both the objects and/or contents of the invention are different, claims 9, 10, 11 and 14 are not obvious over Babayan in the light of Gunstone. The rejection of claims 9, 10, 11 and 14 under Article 103 (a) over Babayan in the light of Gunstone is incorrect and should be withdrawn.

The Examiner also argues "Claims 12 and 13 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Babayan in the light of Gunstone as applied to claims 9, 10, 11 and 14 above, and further in view of 21 C.F.R. 166.4, page 408 and Gunstone

taken together." Claims 12 and 13 are dependent from claim 9, and as patentability has been established for claim 9, claims 12 and 13 are patentable.

Reconsideration and favorable action are solicited.

Respectfully submitted,

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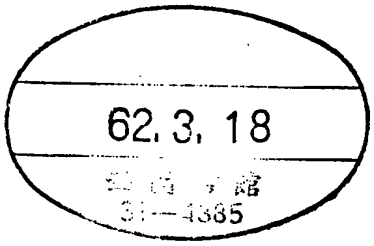

NOTE

Entered words that we have reason to believe constitute trademarks have been designated as such. However, neither the presence nor absence of such designation should be regarded as affecting the legal status of any trademark.

American Indians) a person believed to have supernatural powers of healing; a magician or sorcerer.

medicine shop *n.* (in Malaysia) a Chinese chemist's shop where traditional herbs are sold as well as modern drugs. It is not, however, a dispensary for prescribed medicines.

medick *or U.S.* **medic** ('mɛdɪk) *n.* any small papilionaceous plant of the genus *Medicago*, such as black medick or sickle medick, having yellow or purple flowers and trifoliate leaves. [C15: from Latin *mēdica*, from Greek *mēdikē* (*poa*) Median (grass), a type of clover]

medico ('mɛdɪˌkəʊ) *n., pl.* **-cos.** *Informal.* a doctor or medical student. [C17: via Italian from Latin *medicus*]

medico- *combining form.* medical: *medicolegal.*

medieval *or* **mediaeval** (ˌmɛdɪ'iːvəl) *adj.* **1.** of, relating to, or in the style of the Middle Ages. **2.** *Informal.* old-fashioned; primitive. [C19: from New Latin *medium aevum* the middle age. See MEDIUM, AGE] —ˌ**medi'evally** *or* ˌ**medi'aevally** *adv.*

Medieval Greek *n.* the Greek language from the 7th century A.D. to shortly after the sacking of Constantinople in 1204. Also called: **Middle Greek, Byzantine Greek.** Compare **Koine, Late Greek, Ancient Greek.**

medievalism *or* **mediaevalism** (ˌmɛdɪ'iːvəˌlɪzəm) *n.* **1.** the beliefs, life, or style of the Middle Ages or devotion to those. **2.** a belief, custom, or point of style copied or surviving from the Middle Ages.

medievalist *or* **mediaevalist** (ˌmɛdɪ'iːvəlɪst) *n.* a student or devotee of the Middle Ages. —ˌ**medi,eval'istic** *or* ˌ**medi,aeval'istic** *adj.*

Medieval Latin *n.* the Latin language as used throughout Europe in the Middle Ages. It had many local forms incorporating Latinized words from other languages.

medina (mɛ'diːnə) *n.* (*sometimes cap.*) the ancient quarter of any of various North African cities. Compare **kasbah.** [C20: Arabic, literally: town]

Medina (mɛ'diːnə) *n.* a city in W Saudi Arabia, in Hejaz province: the second most holy city of Islam (after Mecca), with the tomb of Mohammed; university (1960). Pop.: 198 186 (1974). Arabic name: **Al Madinah.**

mediocre (ˌmiːdɪ'əʊkə, 'miːdɪˌəʊkə) *adj. Often derogatory.* average or ordinary in quality: *a mediocre book.* [C16: via French from Latin *mediocris* moderate, literally: halfway up the mountain, from *medius* middle + *ocris* stony mountain]

mediocrity (ˌmiːdɪ'ɒkrɪtɪ, ˌmɛd-) *n., pl.* **-ties.** **1.** the state or quality of being mediocre. **2.** a mediocre person or thing: *he is a mediocrity.*

Medit. *abbrev. for* Mediterranean.

meditate ('mɛdɪˌteɪt) *vb.* **1.** (*intr.; foll. by on or upon*) to think about something deeply. **2.** (*intr.*) to reflect deeply on spiritual matters, esp. as a religious act. **3.** (*tr.*) to plan, consider, or think of doing (something). [C16: from Latin *meditārī* to reflect upon] —'**meditative** *adj.* —'**meditatively** *adv.* —'**meditativeness** *n.* —'**medi,tator** *n.*

meditation (ˌmɛdɪ'teɪʃən) *n.* **1.** the act of meditating; contemplation; reflection. **2.** contemplation of spiritual matters, esp. as a religious practice.

Mediterranean (ˌmɛdɪtə'reɪnɪən) *n.* **1.** short for the **Mediterranean Sea.** **2.** a native or inhabitant of a Mediterranean country. ~*adj.* **3.** of, relating to, situated or dwelling on or near the Mediterranean Sea. **4.** denoting a postulated subdivision of the Caucasoid race, characterized by slender build and dark complexion. **5.** *Meteorol.* (of a climate) characterized by hot summers and relatively warm winters when most of the annual rainfall occurs. **6.** (*often not cap.*) *Obsolete.* situated in the middle of a land mass; inland. [C16: from Latin *mediterrāneus*, from *medius* middle + *-terrāneus*, from *terra* land, earth]

Mediterranean fever *n.* another name for **brucellosis.**

Mediterranean fruit fly *n.* a species of dipterous fly, *Ceratitis capitata*, having marbled wings, whose maggots tunnel into fruits such as citrus, peach, and vine in the Mediterranean area, South Africa, and elsewhere: family *Trypetidae.* Also called: **Medfly.**

Mediterranean Sea *n.* a large inland sea between S Europe, N Africa, and SW Asia: linked with the Atlantic by the Strait of Gibraltar, with the Red Sea by the Suez Canal, and with the Black Sea by the Dardanelles, Sea of Marmara, and Bosporus; many ancient civilizations developed around its shores. Greatest depth: 4770 m (15 900 ft.). Length: (west to east) over 3700 km (2300 miles). Greatest width: about 1368 km (850 miles). Area: (excluding the Black Sea) 2 512 300 sq. km (970 000 sq. miles). Ancient name: '**Mare In'ternum.**

medium ('miːdɪəm) *adj.* **1.** midway between extremes; average: *a medium size.* **2.** (of a colour) reflecting or transmitting a moderate amount of light: *a medium red.* Compare **light**[1] (sense 28), **dark** (sense 2). ~*n., pl.* **-dia** (-dɪə) *or* **-diums.** **3.** an intermediate or middle state, degree, or condition; mean: *the happy medium.* **4.** an intervening substance or agency for transmitting or producing an effect; vehicle: *air is a medium for sound.* **5.** a means or agency for communicating or diffusing information, news, etc., to the public: *television is a powerful medium.* **6.** a person supposedly used as a spiritual intermediary between the dead and the living. **7.** the substance in which specimens of animals and plants are preserved or displayed. **8.** *Biology.* short for **culture medium.** **9.** the substance or surroundings in which an organism naturally lives or grows. **10.** *Art.* **a.** the category of a work of art, as determined by its materials and methods of production: *the medium of wood engraving.* **b.** the materials used in a work of art. **11.** any solvent in which pigments are mixed and thinned. **12.** any one of various sizes of writing or printing paper, esp. 18½ by 23½ inches or 17½ by 22 inches (**small medium**). ~See also **mediums.** [C16: from Latin: neuter singular of *medius* middle]

▷ **Usage.** Careful writers and speakers do not use *media* as a singular noun when referring to a medium of mass communication, although this use is common: *television is a valuable medium* (not *media*) *for advertising.*

medium-dated *adj.* (of a gilt-edged security) having between five and fifteen years to run before redemption. Compare **long-dated, short-dated.**

m dium frequen y *n.* a radio-frequency band or radio frequency lying between 3000 and 300 kilohertz. Abbrev.: **MF.**

medium of ex hange *n.* anything acceptable as a measure of value and a standard of exchange for goods and services in a particular country, region, etc.

medium-range ballistic missile *n.* a missile that can carry a nuclear weapon with a range of 800 to 2400 km. Abbrev.: **MRBM.**

mediums *pl. n.* medium-dated gilt-edged securities.

medium wave *n.* **a.** a radio wave with a wavelength between 100 and 1000 metres. **b.** (*as modifier*): *a medium-wave broadcast.*

medlar ('mɛdlə) *n.* **1.** a small Eurasian rosaceous tree, *Mespilus germanica.* **2.** the fruit of this tree, which resembles the crab apple and is not edible until it has begun to decay. **3.** any of several other rosaceous trees or their fruits. [C14: from Old French *medlier*, from Latin *mespilum* medlar fruit, from Greek *mespilon*]

medley ('mɛdlɪ) *n.* **1.** a mixture of various types or elements. **2.** a musical composition consisting of various tunes arranged as a continuous whole. **3.** Also called: **medley relay.** **a.** *Swimming.* a race in which a different stroke is used for each length. **b.** *Athletics.* a relay race in which each leg has a different distance. **4.** an archaic word for **melee.** ~*adj.* **5.** of, being, or relating to a mixture or variety. [C14: from Old French *medlee*, from *medler* to mix, quarrel]

Médoc (meɪ'dɒk, 'mɛdɒk; *French* medɔk) *n.* **1.** a district of SW France, on the left bank of the Gironde estuary: famous vineyards. **2.** a fine red wine from this district.

medulla (mɪ'dʌlə) *n., pl.* **-las** *or* **-lae** (-liː). **1.** *Anatomy.* **a.** the innermost part of an organ or structure. **b.** short for **medulla oblongata.** **2.** *Botany.* another name for **pith** (sense 4). [C17: from Latin: marrow, pith, probably from *medius* middle] —**me'dullary** *or* **me'dullar** *adj.*

medulla oblongata (ˌɒblɒŋ'gɑːtə) *n., pl.* **medulla oblongatas** *or* **medullae oblongatae** (mɪ'dʌliː ˌɒblɒŋ'gɑːtiː). the lower stalklike section of the brain, continuous with the spinal cord, containing control centres for the heart and lungs. [C17: New Latin: oblong-shaped medulla]

medullary ray *n.* any of the sheets of conducting tissue that run radially through the vascular tissue of some higher plants.

medullary sheath *n.* **1.** *Anatomy.* a myelin layer surrounding and insulating certain nerve fibres. **2.** a layer of thick-walled cells surrounding the pith of the stems of some higher plants.

medullated ('mɛdəˌleɪtɪd, mɪ'dʌl-) *adj.* **1.** *Anatomy.* encased in a myelin sheath. **2.** having a medulla.

medusa (mɪ'djuːzə) *n., pl.* **-sas** *or* **-sae** (-ziː). **1.** another name for **jellyfish** (senses 1, 2). **2.** one of the two forms in which a coelenterate exists. It has a jelly-like umbrella-shaped body, is free swimming, and produces gametes. Also called: **medusoid, medusan.** Compare **polyp.** [C18: from the likeness of its tentacles to the snaky locks of Medusa] —**me'dusan** *adj.*

Medusa (mɪ'djuːzə) *n. Greek myth.* a mortal woman who was transformed by Athena into one of the three Gorgons. Her appearance was so hideous that those who looked directly at her were turned to stone. Perseus eventually slew her. See also **Pegasus**[1]. —**Me'dusan** *adj.*

medusoid (mɪ'djuːzɔɪd) *adj.* **1.** of, relating to, or resembling a medusa. ~*n.* **2.** another name for **medusa** (sense 2).

Medway ('mɛdˌweɪ) *n.* a river in SE England, flowing through Kent and the **Medway towns** (Rochester, Chatham, and Gillingham) to the Thames estuary. Length: 110 km (70 miles).

mee (miː) *n.* (in Malaysia) noodles or a dish containing noodles. [from Chinese (Cantonese) *mien* noodles]

meed (miːd) *n. Archaic.* a recompense; reward. [Old English: wages; compare Old High German *mēta* pay]

meek (miːk) *adj.* **1.** patient, long-suffering, or submissive in disposition or nature; humble. **2.** spineless or spiritless; compliant. **3.** an obsolete word for **gentle.** [C12: related to Old Norse *mjūkr* amenable; compare Welsh *mwytho* to soften] —'**meekly** *adv.* —'**meekness** *n.*

meerkat ('mɪəˌkæt) *n.* any of several South African mongooses, esp. *Suricata suricatta* (**slender-tailed meerkat** *or* **suricate**), which has a lemur-like face and four-toed feet. [C19: from Dutch: sea-cat]

meerschaum ('mɪəʃəm) *n.* **1.** Also called: **sepiolite.** a white, yellowish, or pink compact earthy mineral consisting of hydrated magnesium silicate: used to make tobacco pipes and as a building stone. Formula: $Mg_2Si_3O_6(OH)_4$. **2.** a tobacco pipe having a bowl made of this mineral. [C18: German, literally: sea foam]

Meerut ('mɪərət) *n.* an industrial city in N India, in W Uttar Pradesh: founded as a military base by the British in 1806 and scene of the first uprising (1857) of the Indian Mutiny. Pop.: 417 288 (1981).

meet[1] (miːt) *vb.* **meets, meeting, met.** **1.** (sometimes foll. by *up* or (*U.S.*) *with*) to come together (with), either by design or by accident; encounter: *I met him unexpectedly; we met at the station.* **2.** to come into or be in conjunction or contact with (something or each other): *the roads meet in the town; the sea meets the sky.* **3.** (*tr.*) to come to or be at the place of arrival of: *to meet a train.* **4.** to make the acquaintance of or be introduced to (someone or each other): *have you two met?* **5.** to gather in the company of (someone or each other): *the board of directors meets on Tuesday.* **6.** to come into the presence of (someone or each other) as opponents: *Joe meets Fred in the boxing match.* **7.** (*tr.*) to cope with effectively;

1). —ˌmicroˌphotoˈgraphic *adj.* —**microphotography** (ˌmaɪkrəʊfəˈtɒgrəfɪ) *n.*

microphysics (ˌmaɪkrəʊˈfɪzɪks) *n.* (*functioning as sing.*) the branch of physics concerned with small objects and systems, such as atoms, molecules, nuclei, and elementary particles. —ˌmicroˈphysical *adj.*

microphyte (ˈmaɪkrəʊˌfaɪt) *n.* any microscopic plant, esp. a parasite. —**microphytic** (ˌmaɪkrəʊˈfɪtɪk) *adj.*

microprint (ˈmaɪkrəʊˌprɪnt) *n.* a microphotograph reproduced on paper and read by a magnifying device. It is used in order to reduce the size of large books, etc.

microprism (ˈmaɪkrəʊˌprɪzəm) *n. Photog.* a small prism incorporated in the focusing screen of many single-lens reflex cameras. The prism stops shimmering when the subject is in focus.

microprocessor (ˌmaɪkrəʊˈprəʊsɛsə) *n. Computer technol.* a single integrated circuit performing the basic functions of the central processing unit in a small computer.

microprogram (ˈmaɪkrəʊˌprəʊgræm) *n. Computer technol.* a sequence of microinstructions that controls the operation of an arithmetic and logic unit so that machine code instructions are executed.

micropyle (ˈmaɪkrəʊˌpaɪl) *n.* **1.** a small opening in the integuments of a plant ovule through which the male gametes pass. **2.** a small pore in the shell of an insect's eggs through which the sperm passes. [C19: from MICRO- + Greek *pulē* gate] —ˌmicroˈpylar *adj.*

micropyrometer (ˌmaɪkrəʊpaɪˈrɒmɪtə) *n.* a pyrometer for measuring the temperature of very small objects.

microreader (ˈmaɪkrəʊˌriːdə) *n.* an apparatus that produces an enlarged image of a microphotograph.

microscope (ˈmaɪkrəˌskəʊp) *n.* **1.** an optical instrument that uses a lens or combination of lenses to produce a magnified image of a small, close object. Modern optical microscopes have magnifications of about 1500 to 2000. See also **simple microscope, compound microscope, ultramicroscope.** **2.** any instrument, such as the electron microscope, for producing a magnified visual image of a small object.

microscopic (ˌmaɪkrəˈskɒpɪk) *or* (*less commonly*) **microscopical** *adj.* **1.** not large enough to be seen with the naked eye but visible under a microscope. Compare **macroscopic.** **2.** very small; minute. **3.** of, concerned with, or using a microscope. **4.** characterized by or done with great attention to detail. —ˌmicroˈscopically *adv.*

Microscopium (ˌmaɪkrəˈskəʊpɪəm) *n., Latin genitive* **Microscopii** (ˌmaɪkrəˈskəʊpɪˌaɪ). a faint constellation in the S hemisphere lying near Sagittarius and Capricornus.

microscopy (maɪˈkrɒskəpɪ) *n.* **1.** the study, design, and manufacture of microscopes. **2.** investigation by use of a microscope. —**microscopist** (maɪˈkrɒskəpɪst) *n.*

microsecond (ˈmaɪkrəʊˌsɛkənd) *n.* one millionth of a second. Symbol: μs

microseism (ˈmaɪkrəʊˌsaɪzəm) *n.* a very slight tremor of the earth's surface, thought not to be caused by an earthquake. —**microseismic** (ˌmaɪkrəʊˈsaɪzmɪk) *or* ˌ**micro'seismical** *adj.*

microsome (ˈmaɪkrəʊˌsəʊm) *n.* any of the small particles consisting of ribosomes and fragments of attached endoplasmic reticulum that can be isolated from cells by centrifugal action. —ˌmicroˈsomal *adj.*

microsporangium (ˌmaɪkrəʊspɔːˈrændʒɪəm) *n., pl.* **-gia** (-dʒɪə). the structure in certain ferns in which the microspores are formed: corresponds to the pollen sac in seed plants. Compare **megasporangium.**

microspore (ˈmaɪkrəʊˌspɔː) *n.* **1.** the smaller of two types of spore produced by some ferns, which develops into the male gametophyte. Compare **megaspore** (sense 1). **2.** the pollen grain of seed plants. —ˌmicroˈsporic *or* ˌmicroˈsporous *adj.*

microsporophyll (ˌmaɪkrəʊˈspɔːrəfɪl) *n.* a leaf on which the microspores are formed: corresponds to the stamen of a flowering plant. Compare **megasporophyll.** [C19: from MICRO- + SPOROPHYLL]

microstomatous (ˌmaɪkrəʊˈstɒmətəs) *or* **microstomous** (maɪˈkrɒstəməs) *adj. Anatomy.* having an unusually small mouth.

microstructure (ˈmaɪkrəʊˌstrʌktʃə) *n.* structure on a microscopic scale, esp. the structure of an alloy as observed by etching, polishing, and observation under a microscope.

microsurgery (ˌmaɪkrəʊˈsɜːdʒərɪ) *n.* intricate surgery performed on cells, tissues, etc., using a specially designed operating microscope and miniature precision instruments. —ˌmicroˈsurgical *adj.*

microtechnology (ˌmaɪkrəʊtɛkˈnɒlədʒɪ) *n.* technology that uses microelectronics.

microtome (ˈmaɪkrəʊˌtəʊm) *n.* an instrument used for cutting thin sections, esp. of biological material, for microscopical examination.

microtomy (maɪˈkrɒtəmɪ) *n., pl.* **-mies.** the cutting of sections with a microtome. —**microtomic** (ˌmaɪkrəʊˈtɒmɪk) *or* ˌmicroˈtomical *adj.* —**mi'crotomist** *n.*

microtone (ˈmaɪkrəʊˌtəʊn) *n.* any musical interval smaller than a semitone. —ˌmicroˈtonal *adj.* —ˌmicrotoˈnality *n.* —ˌmicroˈtonally *adv.*

microtubule (ˌmaɪkrəʊˈtjuːbjuːl) *n. Biology.* a tubular aggregate of protein subunits that forms structures, such as the mitotic spindle or the cilia of animal cells or of protozoans, in which it interacts with other proteins to generate various cellular movements.

microvillus (ˌmaɪkrəʊˈvɪləs) *n., pl.* **-li** (-laɪ). *Physiol.* a thin protuberance present in great abundance at the surface of some epithelial cells, notably in the gut, thus increasing the surface area available for absorption.

microwave (ˈmaɪkrəʊˌweɪv) *n.* **a.** electromagnetic radiation in the wavelength range 0.3 to 0.001 metres: used in radar, cooking, etc. **b.** (*as modifier*): *microwave generator.*

micr wav detector *n. N.Z.* a device for recording the speed of a motorist.

microwave oven *n.* an oven in which food is cooked by microwaves.

micr wave sp ctroscopy *n.* a type of spectroscopy in which information is obtained on the structure and chemical bonding of molecules and crystals by measurements of the wavelengths of microwaves emitted or absorbed by the sample. —**microwave spectroscope** *n.*

microwriter (ˈmaɪkrəʊˌraɪtə) *n.* a small device with six keys for creating text that can be printed or displayed on a visual display unit.

microurgy (ˈmaɪkrɜːdʒɪ) *n. Biology.* the manipulation and examination of single cells under a microscope. [C20: from MICRO- + Greek *-ourgia* work]

micturate (ˈmɪktjʊˌreɪt) *vb.* (*intr.*) a less common word for **urinate.** [C19: from Latin *micturīre* to desire to urinate, from *mingere* to urinate] —**micturition** (ˌmɪktjʊˈrɪʃən) *n.*

mid[1] (mɪd) *adj.* **1.** *Phonetics.* of, relating to, or denoting a vowel whose articulation lies approximately halfway between high and low, such as *e* in English *bet.* ~*n.* **2.** an archaic word for **middle.** [C12 *midre* (inflected form of *midd,* untested); related to Old Norse *mithr,* Gothic *midjis*]

mid[2] *or* **'mid** (mɪd) *prep.* a poetic word for **amid.**

mid. *abbrev. for* middle.

Mid. *abbrev. for* Midshipman.

mid- *combining form.* indicating a middle part, point, time, or position: *midday; mid-April; mid-Victorian.* [Old English; see MIDDLE, MID[1]]

midair (ˌmɪdˈɛə) *n.* **a.** some point above ground level, in the air. **b.** (*as modifier*): *a midair collision of aircraft.*

Midas (ˈmaɪdəs) *n.* **1.** *Greek legend.* a king of Phrygia given the power by Dionysus of turning everything he touched to gold. **2. the Midas touch.** ability to make money.

MIDAS (ˈmaɪdəs) *n. acronym for* Missile Defence Alarm System.

mid-Atlantic *adj.* characterized by a blend of British and American styles, elements, etc.: *a disc jockey's mid-Atlantic accent.*

midbrain (ˈmɪdˌbreɪn) *n.* the nontechnical name for **mesencephalon.**

midday (ˈmɪdˈdeɪ) *n.* **a.** the middle of the day; noon. **b.** (*as modifier*): *a midday meal.*

Middelburg (ˈmɪdəlˌbɜːg; *Dutch* ˈmɪdəlbyrx) *n.* a city in the SW Netherlands, capital of Zeeland province, on Walcheren Island: an important trading centre in the Middle Ages and member of the Hanseatic League; 12th-century abbey; market town. Pop.: 38 655 (1982 est.).

midden (ˈmɪdᵊn) *n.* **1. a.** *Archaic or dialect.* a dunghill or pile of refuse. **b.** *Dialect.* a dustbin. **c.** *Northern English dialect.* an earth closet. **2.** See **kitchen midden.** [C14: from Scandinavian; compare Danish *mödding* from *mög* MUCK + *dynge* pile]

✱**middle** (ˈmɪdᵊl) *adj.* **1.** equally distant from the ends or periphery of something; central. **2.** intermediate in status, situation, etc. **3.** located between the early and late parts of a series, time sequence, etc. **4.** not extreme, esp. in size; medium. **5.** (esp. in Greek and Sanskrit grammar) denoting a voice of verbs expressing reciprocal or reflexive action. Compare **active** (sense 5), **passive** (sense 5). **6.** (*usually cap.*) (of a language) intermediate between the earliest and the modern forms: *Middle English.* ~*n.* **7.** an area or point equal in distance from the ends or periphery or in time between the early and late parts. **8.** an intermediate part or section, such as the waist. **9.** *Grammar.* the middle voice. **10.** *Logic.* See **middle term.** **11.** the ground between rows of growing plants. **12.** a discursive article in a journal, placed between the leading articles and the book reviews. ~*vb.* (*tr.*) **13.** to place in the middle. **14.** *Nautical.* to fold in two. **15.** *Football.* to return (the ball) from the wing to midfield. **16.** *Cricket.* to hit (the ball) with the middle of the bat. [Old English *middel*; compare Old Frisian *middel,* Dutch *middel,* German *mittel*]

middle age *n.* the period of life between youth and old age, usually (in man) considered to occur approximately between the ages of 40 and 60. —ˌ**middle-'aged** *adj.*

Middle Ages *n.* **the.** *European history.* **1.** (broadly) the period from the end of classical antiquity (or the deposition of the last W Roman emperor in 476 A.D.) to the Italian Renaissance (or the fall of Constantinople in 1453). **2.** (narrowly) the period from about 1000 A.D. to the 15th century. Compare **Dark Ages.**

Middle America *n.* **1.** the territories between the U.S. and South America: Mexico, Central America, Panama, and the Greater and Lesser Antilles. **2.** the U.S. middle class, esp. those groups that are politically conservative. —**Middle American** *adj., n.*

Middle Atlantic States *or* **Middle States** *pl. n.* the states of New York, Pennsylvania, and New Jersey.

middlebreaker (ˈmɪdᵊlˌbreɪkə) *or* **middlebuster** *n.* a type of plough that cuts a furrow with the soil heaped on each side, often used for sowing. Also called: **lister.**

middlebrow (ˈmɪdᵊlˌbraʊ) *Disparaging.* ~*n.* **1.** a person with conventional tastes and limited cultural appreciation. ~*adj. also* **middlebrowed.** **2.** of or appealing to middlebrows: *middlebrow culture.* —**'middleˌbrowism** *n.*

middle C *n. Music.* the note graphically represented on the first ledger line below the treble staff or the first ledger line above the bass staff and corresponding in pitch to an internationally standardized fundamental frequency of 261.63 hertz.

middle class *n.* **1.** Also called: **bourgeoisie.** a social stratum that is not clearly defined but is positioned between the lower and upper classes. It consists of businessmen, professional people, etc., along with their families, and is marked by bourgeois values. Compare **lower class, upper class, work-**

rasping ('rɑːspɪŋ) *or* **raspy** *adj.* (esp. of a noise) harsh or grating; rough.
raspings ('rɑːspɪŋz) *pl. n.* browned breadcrumbs for coating fish and other foods before frying, baking, etc.
Rasputin (ræ'spjuːtɪn; *Russian* ras'putin) *n.* **Grigori Efimovich** (grɪ'gɔrij jɪ'fimɔvitʃ). ?1871–1916, Siberian peasant monk, notorious for his debauchery, who wielded great influence over Tsarina Alexandra. He was assassinated by a group of Russian noblemen.
rasse ('ræsɪ, ræs) *n.* a small civet, *Viverricula indica*, of S and SE Asia. [C19: from Javanese *rase*]
Rasta ('ræstə) *n., adj.* short for **Rastafarian.**
Ras Tafari (ræs tə'fɑːrɪ) *n.* See **Haile Selassie.**
Rastafarian (ˌræstə'fɛərɪən) *n.* **1.** a member of a Jamaican cult that regards **Ras Tafari** (the former emperor of Ethiopia, Haile Selassie) as God. ~*adj.* **2.** of, characteristic of, or relating to the Rastafarians.
raster ('ræstə) *n.* a pattern of horizontal scanning lines traced by an electron beam, esp. on a television screen. [C20: via German from Latin: rake, from *râdere* to scrape]
rat (ræt) *n.* **1.** any of numerous long-tailed murine rodents, esp. of the genus *Rattus*, that are similar to but larger than mice and are now distributed all over the world. See also **brown rat, black rat.** **2.** *Informal.* a person who deserts his friends or associates, esp. in time of trouble. **3.** *Informal.* a worker who works during a strike; blackleg; scab. **4.** *Slang, chiefly U.S.* an informer; stool pigeon. **5.** *Informal.* a despicable person. **6. smell a rat.** to detect something suspicious. ~*vb.* **rats, ratting, ratted.** **7.** (*intr.*; usually foll. by *on*) *Informal.* **a.** to divulge secret information (about); betray the trust (of). **b.** to default (on); abandon: *he ratted on the project at the last minute.* **8.** to hunt and kill rats. ~See also **rats.** [Old English *rætt*; related to Old Saxon *ratta*, Old High German *ratz*] —'**rat,like** *adj.*
rata ('rɑːtə) *n.* either of two New Zealand myrtaceous forest trees, *Metrosideros robusta* or *M. lucida*, having crimson flowers and hard wood. [C19: from Maori]
ratable *or* **rateable** ('reɪtəbᵊl) *adj.* **1.** able to be rated or evaluated. **2.** *Brit.* (of property) liable to payment of rates. —ˌ**rata'bility, ˌratea'bility** *or* '**ratableness, 'rateableness** *n.* —'**ratably** *or* '**rateably** *adv.*
ratable value *or* **rateable value** *n. Brit.* a fixed value assigned to a property by a local authority, on the basis of which variable annual rates are charged.
ratafia (ˌrætə'fɪə) *or* **ratafee** (ˌrætə'fiː) *n.* **1.** any liqueur made from fruit or from brandy with added fruit. **2.** a flavouring essence made from almonds. **3.** *Chiefly Brit.* Also called: **ratafia biscuit.** a small macaroon flavoured with almonds. [C17: from West Indian Creole French]
ratal ('reɪtᵊl) *Brit.* ~*n.* **1.** the amount on which rates are assessed; ratable value. ~*adj.* **2.** of or relating to rates (local taxation). [C19: see RATE¹]
ratan (rə'tæn) *n.* a variant spelling of **rattan.**
ratatat-tat ('rætəˌtæt'tæt) *or* **ratatat** ('rætə'tæt) *n.* the sound of knocking on a door.
ratatouille (ˌrætə'twiː) *n.* a vegetable casserole made of tomatoes, aubergines, peppers, etc., fried in oil and stewed slowly. [C19: from French, from *touiller* to stir, from Latin *tudiculâre*, from *tudes* hammer]
ratbag ('rætˌbæg) *n. Slang.* an eccentric, stupid, or unreliable person. [C20: from RAT + BAG]
ratbaggery ('rætˌbægərɪ) *n. Austral. slang.* nonsense, eccentricity.
ratbite fever *or* **disease** ('rætˌbaɪt) *n. Pathol.* an acute infectious febrile disease caused by the bite of a rat infected with either of two pathogenic bacteria (*Streptobacillus moniliformis* or *Spirillum minus*).
rat-catcher *n.* a person whose job is to destroy or drive away vermin, esp. rats.
ratchet ('rætʃɪt) *n.* **1.** a device in which a toothed rack or wheel is engaged by a pawl to permit motion in one direction only. **2.** the toothed rack or wheel forming part of such a device. [C17: from *rochet*, from Old French *rocquet* blunt head of a lance, of Germanic origin: compare Old High German *rocko* distaff]
rate¹ (reɪt) *n.* **1.** a quantity or amount considered in relation to or measured against another quantity or amount: *a rate of 70 miles an hour.* **2.** a price or charge with reference to a standard or scale: *rate of interest; rate of discount.* **3.** a charge made per unit for a commodity, service, etc. **4.** See **rates.** **5.** the relative speed of progress or change of something variable; pace: *he works at a great rate; the rate of production has doubled.* **6. a.** relative quality; class or grade. **b.** (*in combination*): *first-rate ideas.* **7.** *Statistics.* a measure of the frequency of occurrence of a given event, such as births and deaths, usually expressed as the number of times the event occurs for every thousand of the total population considered. **8.** a wage calculated against a unit of time. **9.** the amount of gain or loss of a timepiece. **10. at any rate.** in any case; at all events; anyway. ~*vb.* (*mainly tr.*) **11.** (*also intr.*) to assign or receive a position on a scale of relative values; rank: *he is rated fifth in the world.* **12.** to estimate the value of; evaluate: *we rate your services highly.* **13.** to be worthy of; deserve: *this hotel does not rate four stars.* **14.** to consider; regard: *I rate him among my friends.* **15.** *Brit.* to assess the value of (property) for the purpose of local taxation. **16.** *Slang.* to think highly of: *the clients do not rate the new system.* [C15: from Old French, from Medieval Latin *rata*, from Latin *prō ratā parte* according to a fixed proportion, from *ratus* fixed, from *rērī* to think, decide]
rate² (reɪt) *vb.* (*tr.*) to scold or criticize severely; rebuke harshly. [C14: perhaps related to Swedish *rata* to chide]
rateabl ('reɪtəbᵊl) *adj.* a variant spelling of **ratable.**
rate-cap ('reɪtˌkæp) *vb.* (*tr.*) **-caps, -capping, -capped.** (in Britain) to impose on (a local authority) an upper limit on the level of the rate it may levy. —'**rate-ˌcapping** *n.*
rate n (ræ'tiːn) *n.* a variant spelling of **ratine.**
ratel ('reɪtᵊl) *n.* a musteline mammal, *Mellivora capensis*, inhabiting wooded regions of Africa and S Asia. It has a massive body, strong claws, and a thick coat that is paler on the back and it feeds on honey and small animals. Also called: **honey badger.** [C18: from Afrikaans]
rate of exchange *n.* See **exchange rate.**
ratepayer ('reɪtˌpeɪə) *n. Brit.* a person who pays local rates, esp. a householder.
rates (reɪts) *pl. n. Brit.* a tax on property levied by a local authority.
ratfink ('rætˌfɪŋk) *n. Slang, chiefly U.S. and Canadian.* a contemptible or undesirable person. [C20: from RAT + FINK]
ratfish ('rætˌfɪʃ) *n., pl.* **-fish** *or* **-fishes.** **1.** another name for **rabbitfish** (sense 1). **2.** a chimaera, *Hydrolagus colliei*, of the North Pacific Ocean, which has a long narrow tail.
rath (raθ) *n. Irish history.* a circular enclosure surrounded by an earthen wall: used as a dwelling and stronghold in former times. [C16: from Irish Gaelic]
ratha (rʌt) *n.* (in India) a four-wheeled carriage drawn by horses or bullocks; chariot. [Hindi]
rathe (reɪð) *or* **rath** (rɑːθ) *adj. Archaic or literary.* **1.** blossoming or ripening early in the season. **2.** eager or prompt. [Old English *hrathe*; related to Old High German *hrado*, Old Norse *hrathr*]
Rathenau (*German* 'raːtənau) *n.* **Walther** ('valtər). 1867–1922, German industrialist and statesman: he organized the German war industries during World War I, became minister of reconstruction (1921) and of foreign affairs (1922), and was largely responsible for the treaty of Rapallo with Russia. His assassination by right-wing extremists caused a furore.
rather ('rɑːðə) *adv.* (*in senses 1-4, not used with a negative*) **1.** relatively or fairly; somewhat: *it's rather dull.* **2.** to a significant or noticeable extent; quite: *she's rather pretty.* **3.** to a limited extent or degree: *I rather thought that was the case.* **4.** with better or more just cause: *this text is rather to be deleted than rewritten.* **5.** more readily or willingly; sooner: *I would rather not see you tomorrow.* ~*sentence connector.* **6.** on the contrary: *it's not cold. Rather, it's very hot indeed.* ~*sentence substitute.* ('rɑː'ðɜː). **7.** an expression of strong affirmation, often in answer to a question: *Is it worth seeing? Rather!* [Old English *hrathor* comparative of *hræth* READY, quick; related to Old Norse *hrathr*]
▷ **Usage.** Both *would* and *had* are used with *rather* in sentences such as *I would rather* (or *had rather*) *go to the film than to the play. Had rather* is less common and now widely regarded as slightly old-fashioned.
rat house *n. Austral. slang.* a mental hospital.
ratify ('rætɪˌfaɪ) *vb.* **-fies, -fying, -fied.** (*tr.*) to give formal approval or consent to. [C14: via Old French from Latin *ratus* fixed (see RATE¹) + *facere* to make] —'**ratiˌfiable** *adj.* —ˌ**ratifi'cation** *n.* —'**ratiˌfier** *n.*
ratine, rateen, ratteen (ræ'tiːn), *or* **ratiné** ('rætɪˌneɪ) *n.* a coarse loosely woven cloth. [C17: from French, from *ratine*, of obscure origin]
rating¹ ('reɪtɪŋ) *n.* **1.** a classification according to order or grade; ranking. **2.** (in certain navies) a sailor who holds neither commissioned nor warrant rank; an ordinary seaman. **3.** *Sailing.* a handicap assigned to a racing boat based on its dimensions, sail area, weight, draught, etc. **3.** the estimated financial or credit standing of a business enterprise or individual. **4.** *Radio, television, etc.* a figure based on statistical sampling indicating what proportion of the total listening and viewing audience tune in to a specific programme or network.
rating² ('reɪtɪŋ) *n.* a sharp scolding or rebuke.
ratio ('reɪʃɪˌəʊ) *n., pl.* **-tios.** **1.** a measure of the relative size of two classes expressible as a proportion: *the ratio of boys to girls is 2 to 1.* **2.** *Maths.* a quotient of two numbers or quantities. See also **proportion** (sense 6). [C17: from Latin: a reckoning, from *rērī* to think; see REASON]
ratiocinate (ˌrætɪ'ɒsɪˌneɪt) *vb.* (*intr.*) to think or argue logically and methodically; reason. [C17: from Latin *ratiōcinārī* to calculate, from *ratiō* REASON] —ˌ**ratiˌoci'nation** *n.* —ˌ**rati'ocinative** *adj.* —ˌ**rati'ociˌnator** *n.*
ration ('ræʃən) *n.* **1. a.** a fixed allowance of food, provisions, etc., esp. a statutory one for civilians in time of scarcity or soldiers in time of war: *a tea ration.* **b.** (*as modifier*): *a ration book.* **2.** a sufficient or adequate amount: *you've had your ration of television for today.* ~*vb.* (*tr.*) **3.** (often foll. by *out*) to distribute (provisions), esp. to an army. **4.** to restrict the distribution or consumption of (a commodity) by (people): *the government has rationed sugar; sugar is short, so I'll have to ration you.* ~See also **rations.** [C18: via French from Latin *ratiō* calculation; see REASON]
rational ('ræʃənᵊl) *adj.* **1.** using reason or logic in thinking out a problem. **2.** in accordance with the principles of logic or reason; reasonable. **3.** of sound mind; sane: *the patient seemed quite rational.* **4.** endowed with the capacity to reason; capable of logical thought: *man is a rational being.* **5.** *Maths.* **a.** expressible as a ratio of two integers: *a rational number.* **b.** (of an expression, equation, etc.) containing no variable either in irreducible radical form or raised to a fractional power. ~*n.* **6.** *Maths.* a rational number. [C14: from Latin *ratiōnālis*, from *ratiō* REASON] —'**rationally** *adv.* —'**rationalness** *n.*
rationale (ˌræʃə'nɑːl) *n.* a reasoned exposition, esp. one defining the fundamental reasons for a course of action, belief, etc. [C17: from New Latin, from Latin *ratiōnālis*]
rationalism ('ræʃənəˌlɪzəm) *n.* **1.** reliance on reason rather than intuition to justify one's beliefs or actions. **2.** *Philosophy.* **a.** the doctrine that knowledge about reality can be obtained by reason alone without recourse to experience. **b.** the

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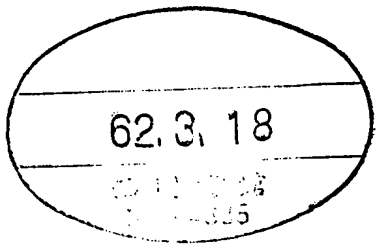

the lungs; *also* the contents or walls of this space [NL, fr L, neut of *mediastinus* medial, fr *medius*] – **mediastinal** *adj*

[1]mediate /'meedi·ət/ *adj* acting through an intervening agent or agency; indirect [ME, fr LL *mediatus* intermediate, fr pp of *mediare*] – **mediacy** *n*, **mediately** *adv*, **mediateness** *n*

[2]mediate /'meedi,ayt/ *vi* 1 to intervene between parties in order to reconcile them 2 to reconcile differences 3 to be in a middle or intermediate position ~ *vt* 1a to effect by action as an intermediary b to bring about (a settlement) by mediation 2a to act as intermediary agent in bringing, effecting, or communicating b to transmit as an intermediate mechanism or agency [ML *mediatus*, pp of *mediare*, fr LL, to be in the middle, fr L *medius* middle – more at MID] – **mediative, mediatory, mediatorial** *adj*, **mediatorially** *adv*

mediation /,meedi'aysh(ə)n/ *n* the act or process of mediating; *esp* intervention by a neutral person or body between conflicting parties (e g warring states or trades unions and employers) to bring about reconciliation, settlement, or compromise – **mediational** *adj*

mediat·ize, -ise /'meediətiez/ *vt* to annex (a state) to a larger state while leaving the former ruler with a title and often some governing rights [Ger *mediatisieren*, fr *mediat* mediate, fr LL *mediatus*] – **mediatization** *n*

mediator /'meediaytə/, *fem* **mediatrice** /'meediaytris/, **mediatrix** /-triks/ *n* 1 one who or that which mediates; *esp* one who mediates between parties at variance 2 something (e g an enzyme or hormone) that mediates in a chemical or biological process

[1]medic /'medik/ *n*, *NAm* MEDICK (plant of the pea family)

[2]medic *n*, *informal* 1 one engaged in medical work; *esp* a medical doctor or student 2 a usu noncombative doctor or medical orderly attached to a military unit [L *medicus* physician]

medicable /'medikəbl/ *adj* curable, remediable [L *medicabilis*, fr *medicare* to heal]

[1]medical /'medikl/ *adj* 1 of or concerned with physicians or the practice of medicine 2 requiring or devoted to medical treatment [Fr or LL; Fr *médical*, fr LL *medicalis*, fr L *medicus* physician, fr *mederi* to heal; akin to Avestan *vī-mad-* healer, L *meditari* to meditate] – **medically** *adv*

[2]medical /'medikl/, **medical examination** *n* an examination of the body functions and condition of an individual to determine their physical fitness for an insurance policy, job, etc

medicament /mi'dikəmənt/ *n* MEDICINE 1 – **medicamentous, medicamental, medicamentary** *adj*

Medicare /'medikeə/ *n* a comprehensive medical insurance, esp for the aged, sponsored by the US and Canadian governments [blend of *medical* and *care*]

medicate /'medikayt/ *vt* 1 to treat medicinally 2 to impregnate with a medicinal substance ⟨~d *soap*⟩ [L *medicatus*, pp of *medicare* to heal, fr *medicus*]

medication /medi'kaysh(ə)n/ *n* 1 the act or process of medicating 2 a medicinal substance; MEDICINE 1

medicinal /mə'dis(ə)nl/ *adj* 1 tending or used to cure disease or relieve pain 2 SALUTARY (producing a beneficial effect) – **medicinal** *n*, **medicinally** *adv*

medicinal leech *n* a large European freshwater leech (*Hirudo medicinalis*) formerly used by physicians for bleeding patients

medicine /'med(ə)sin/ *n* 1 a substance or preparation used (as if) in treating disease 2a the science and art of the maintenance of health and the prevention, alleviation, or cure of disease b the branch of medicine concerned with the nonsurgical treatment of disease 3 the profession or practice of medicine ⟨*she's going in for* ~⟩ 4 something held by primitive people, esp of N America, to have remedial or magical properties; *also* the magical power of the object or the ritual in which it is used – not used technically in ethnology [ME, fr OF, fr L *medicina*, fr fem of *medicinus* of a physician, fr *medicus*] – **take one's medicine** to accept one's due punishment; submit to something unpleasant

usage The pronunciation /'medsin/ with two syllables is recommended for BBC broadcasters

medicine ball *n* a heavy stuffed leather-covered ball that is usu thrown between people for exercise

medicine chest *n* a box or cabinet containing medicines, bandages, etc

medicinedropper *n* DROPPER 2 (device for measuring medicines)

medicine man *n* a healer or sorcerer believed to have supernatural powers of healing esp among the N American Indians; a shaman – compare WITCH DOCTOR

medick, *NAm* medic /'medik/ *n* any of a genus (*Medicago*) of small plants (e g lucerne) of the pea family that have purple or yellow flowers [ME *medike*, fr L *medica*, fr Gk *mēdikē*, fr fem of *mēdikos* of Media, fr *Mēdia* Media, ancient country in SW Asia]

medico /'medikoh/ *n*, *pl* **medicos** *informal* [2]MEDIC [It *medico* or Sp *médico*, both fr L *medicus*]

medico- *comb form* medical ⟨medico*psychology*⟩; medical and ⟨medico*legal*⟩ [NL, fr L *medicus*]

medieval, mediaeval /,medi'eevl/ *adj* 1 (characteristic) of the Middle Ages 2 *informal* old-fashioned, primitive [*medi-* + L *aevum* age – more at AYE] – **medievally** *adv*

medievalism /,medi'eevəliz(ə)m/ *n* 1 medieval qualities, character, or beliefs 2 devotion to or copying of the institutions, arts, and practices of the Middle Ages

medievalist /,medi'eevəlist/ *n* a specialist in or devotee of medieval history, culture, or languages – **medievalistic** *adj*

Medieval Latin *n* the Latin used esp for liturgical and literary purposes from the 7th to the 15th centuries

medio- – see MEDI-

mediocre /,meedi'ohkə/ *adj* 1 neither good nor bad; indifferent; *esp* conspicuously lacking distinction or imagination 2 not good enough; fairly bad [ME, fr L *mediocris*, lit., halfway up a mountain, fr *medi-* + *ocris* stony mountain; akin to L *acer* sharp – more at EDGE]

usage Some people dislike expressions such as ⟨*a very* **mediocre** *performance*⟩, and feel that things either are or are not **mediocre**.

mediocrity /meedi'okrəti/ *n* 1a the quality or state of being mediocre b mediocre ability or value 2 a mediocre person

meditate /'meditayt/ *vt* 1 to focus one's thoughts on; consider or plan in the mind – often + *on* 2 to plan or project in the mind ~ *vi* 1 to engage in deep or serious reflection ⟨*he* ~d *for two days before giving a reply*⟩ 2 to empty the mind of thoughts and fix the attention on one matter, esp for religious or therapeutic reasons or to develop mental faculties [L *meditatus*, pp of *meditari* – more at METE] – **meditator** *n*, **meditative** *adj*, **meditatively** *adv*, **meditativeness** *n*, **meditation** *n*

Mediterranean /,meditə'raynyən, -ni·ən/ *adj* 1a of or characteristic of the (region around the) Mediterranean sea b *of a climate* characterized by hot summers and mild rainy winters 2 of a group or physical type of the CAUCASIAN (white-skinned) race characterized by medium or short stature, slender build, and dark complexion 3 *not cap, obs* enclosed or nearly enclosed with land [(3) L *mediterraneus*, fr *medi-* + *terra* land; (1, 2) the *Mediterranean* sea, between Europe & Africa]

Mediterranean fever *n* BRUCELLOSIS (disease of humans and cattle)

Mediterranean flour moth *n* a small largely grey and black widely distributed moth (*Ephestia kuehniella*) whose larva destroys processed grain products

Mediterranean fruit fly *n* a widely distributed fly (*Ceratitis capitata*) with black and white markings whose larva lives and feeds in ripening fruit

[1]medium /'meedi·əm/ *n*, *pl* **mediums, media** /-diə/, (*2e*) **mediums,** (*2b&3b*) **media** *also* **mediums** 1 (something in) a middle position or state 2 a means of effecting or conveying something: e g 2a(1) a substance regarded as the means of transmission of a force or effect ⟨*air is the* ~ *that conveys sound*⟩ a(2) a surrounding or enveloping substance; *esp* MATRIX 3 b a channel or means of communication; *esp* one (e g television) designed to reach large numbers of people c a mode of artistic expression ⟨*discovered his true* ~ *as a writer*⟩ d an intermediary, go-between e someone through whom others seek to communicate with the spirits of the dead f a material or technical means of artistic expression ⟨*found watercolour a satisfying* ~⟩ 3a a condition or environment in which something may function or flourish b(1) a nutrient system for the artificial cultivation of cells or organisms, esp bacteria b(2) a liquid or solid in which animal or plant structures are placed (e g for preservation) c a liquid (e g oil or water) with which dry colouring material (PIGMENT) can be mixed 4 a size of paper usu 23 x 18 inches (584 × 457 millimetres) ***usage*** see MEDIA [L, fr neut of *medius* middle – more at MID]

[2]medium *adj* intermediate in amount, quality, position, or degree

medium frequency *n* a radio frequency in the range between 300 and 3000 kilohertz

mediumistic /,meediə'mistik/ *adj* (having the qualities) of a spiritualistic medium

medium of exchange *n* something commonly accepted in

of the embryonic brain of VERTEBRATE animals; *also* those parts of the fully differentiated and specialized brain developed from this region

midday /-'day/ *n* the middle part of the day; noon

midden /'mid(ə)n/ *n* 1 a dunghill 2 a refuse heap; *esp* a heap or stratum of domestic rubbish found on the site of an ancient settlement [ME *midding*, of Scand origin; akin to ON *myki* dung & ON *dyngja* manure pile – more at MUCUS, DUNG]

[1]middle /'midl/ *adj* 1 equally distant from the extremes; central ⟨*the ~ house in the row*⟩ 2 at neither extreme; intermediate 3 *cap* 3a constituting a division intermediate between those earlier and later or Lower and Upper ⟨Middle *Palaeozoic*⟩ b constituting a period of a language intermediate between one called *Old* and one called *New* or *Modern* ⟨Middle *Dutch*⟩ 4 *of a verb form or voice* typically asserting that one both performs and is affected by the action represented; expressing reflexive or reciprocal action [ME *middel*, fr OE; akin to L *medius*]

[2]middle *n* 1 a middle part, point, or position 2 the central portion of the human body; the waist 3 the position of being among or in the midst of something 4 something intermediate between extremes; a mean

[3]middle *vt* 1 to hit (a shot) accurately with the middle of the bat in cricket ⟨*his timing was all wrong and he couldn't ~ his shots*⟩ 2 to fold in the middle ⟨*~ a sail*⟩

middle age *n* the period of life from about 40 to about 60 – **middle-aged** *adj*

middle-aged spread *n* an increase in girth, esp round the waist, associated with middle age and usu caused by increased food intake or a decline in physical exercise or both

Middle Ages *n pl* the period of European history from about AD 500 to about 1500

Middle America *n* 1 the midwestern section of the USA 2 the US MIDDLE CLASS – **Middle American** *n*

middlebrow /-,brow/ *n, chiefly derog* a person with conventional and often bourgeois intellectual and cultural interests and activities – **middlebrow** *adj*

middle C *n* the musical note that is represented on the first extra line (LEDGER LINE) below the TREBLE CLEF or the first ledger line above the BASS CLEF and has a standardized frequency of 261.63 hertz

,middle-'class *adj* of the middle class; *esp* BOURGEOIS 2

middle class *n taking sing or pl vb*, **middle classes** *n pl* a class occupying a position between the upper class and the lower class; *esp* a fluid mixed socioeconomic grouping composed principally of business and professional people, bureaucrats, and some farmers and skilled workers sharing common social characteristics and values

'middle-,distance *adj* competing in or being a running race over a distance between that of a sprint and a long-distance race, specif the 800 metres and 1500 metres runs and the 3000 metres steeplechase

middle distance *n* a part of a picture or view between the foreground and the background

middle ear *n* a small membrane-lined cavity that is separated from the OUTER EAR by the eardrum and that transmits sound waves from the eardrum to the partition between the middle ear and the INNER EAR through a chain of tiny bones

Middle English *n* English from about 1150 to 1500

middle finger *n* the midmost of the five fingers of the hand

Middle French *n* French from about 1300 to 1600

middle game *n* the middle phase of a board game; *specif* the part of a chess game after the opening moves when pieces have been brought out for effective use – compare END GAME, OPENING

Middle Greek *n* Greek from about 600 to 1500

middle ground *n* 1 MIDDLE DISTANCE 2 a standpoint midway between extremes

Middle High German *n* HIGH GERMAN from about 1100 to 1500

Middle Irish *n* Irish from about 1000 to 1500

Middle Low German *n* LOW GERMAN from about 1100 to 1500

middleman /-,man/ *n* an intermediary or agent between two parties; *esp* a dealer or agent intermediate between the producer of goods and the retailer or consumer

middle name *n* 1 a name between a person's FIRST NAME and surname 2 a quality of character for which a person is well known ⟨*generosity is her ~*⟩

,middle-of-the-'road *adj* conforming to the majority in taste, attitude, or conduct; *also* neither left-wing nor right-wing in political conviction – **middle-of-the-roader** *n*, **middle-of-the-roadism** *n*

middler /'midlə/ *n, NAm* one belonging to an intermediate group, division, or class (eg in a school)

middle school *n* a school or part of a school for pupils aged 8–12 or 9–13

Middle Scots *n* the Scots language of the late 15th to early 17th centuries

middle term *n, philosophy* the term of a SYLLOGISM (formal deductive argument) that occurs in both premises

middleweight /-,wayt/ *n* someone or something of average weight; *specif* a boxer who weighs not more than 11 stone 6 pounds (72.6 kilograms) if professional, or between 71 and 75 kilograms (between about 11 stone 2 pounds and 11 stone 11 pounds) if amateur

Middle Welsh *n* Welsh from about 1150 to 1500

[1]middling /'midling/ *adj* 1 of middle, medium, or moderate size, degree, or quality 2 mediocre, second-rate [ME (Sc) *mydlyn*, prob fr *mid, midde* mid + *[2]-ling*] – **middling** *adv*, **middlingly** *adv*

[2]middling *n* 1 any of various commodities of intermediate size, quality, or position 2 *pl but taking sing or pl vb* a granular product of grain milling; *esp* a wheat milling by-product used in animal feeds

middorsal /,mid'dawsl/ *adj* situated in the middle part or the central longitudinal line of the back

middy /'midi/ *n* 1 a loosely fitting blouse with a sailor collar worn by women and children 2 *informal* a midshipman – no longer in vogue [by shortening & alter. fr *midshipman*]

midfield /'mid,feeld, -'-/ *n* 1 the middle portion of a field; *esp* the portion of a playing field (eg in soccer) that is midway between the goals 2 *taking sing or pl vb* the players on a team (eg in lacrosse or soccer) that normally play in midfield – **midfielder** *n*

midge /mij/ *n* a tiny mosquitolike fly (eg a CHIRONOMID) [ME *migge*, fr OE *mycg*; akin to OHG *mucka* midge, Gk *myia* fly, L *musca*]

midget /'mijit/ *n* 1 a very small person; a dwarf 2 something (eg an animal) much smaller than usual 3 a front-engined single-seat open racing car smaller than standard cars of the type [*midge* + *-et*] – **midget** *adj*

midgut /'mid,gut/ *n* the middle part of a digestive tract

midi /'midi/ *n* a woman's garment (eg a skirt) that extends to the mid-calf [*[1]mid* + *-i* (as in *mini*)]

midland /'midlənd/ *n* 1 **midlands** *pl but taking sing vb, also* **midland** *often cap* the interior or central region of a country 2 *cap* 2a the dialect of English spoken in the midland counties of England roughly between Wharfedale, Stratford-on-Avon, Chester, and the Lincolnshire Coast b the dialect of English spoken in the central USA roughly between Tennessee, the Mississippi, the Great Lakes, and the Atlantic – **midland** *adj, often cap*

midline /mid'lien, '-,-/ *n* a middle line; *esp* the middle line or plane of (some part of) the body

midmost /-,mohst/ *adj* 1 in or near the exact middle 2 most intimate; innermost – **midmost** *adv or n*

midnight /'mid,niet/ *n* 1 the middle of the night; *specif* 12 o'clock at night 2 deep or extended darkness or gloom – see also **burn the midnight** OIL – **midnight** *adj*, **midnightly** *adv or adj*

midnight sun *n* the sun above the horizon at midnight in the arctic or antarctic summer

,mid-'off *n* a fielding position in cricket between a third of the way and halfway to the boundary on the OFF SIDE of the pitch, situated in front of the batsman's wicket between EXTRA COVER and the bowler; *also* the fieldsman occupying this position

mid-on *n* a fielding position in cricket between a third of the way and halfway to the boundary on the LEG SIDE of the pitch, situated in front of the batsman's wicket between mid-wicket and the bowler; *also* the fieldsman occupying this position

midpoint /-,poynt/ *n* 1 a point at or near the centre of an area or midway between the ends of a line 2 a point midway between the beginning and end of something (eg a period of time)

midrash /'midrash/ *n, pl* **midrashim** /mid'rashim/ 1 a Jewish work of commentary on a biblical text 2 a collection of midrashim 3 *cap* the midrashic literature written during the first 1000 years of the Christian era [Heb *midhrāsh* exposition, explanation] – **midrashic** *adj, often cap*

midrib /-,rib/ *n* the central vein of a leaf

midriff /'midrif/ *n* 1 DIAPHRAGM 1 2 the middle part of the

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Effects of Medium- and Long-Chain Triglyceride Diets in the Genetically Obese Zucker Rat[1]

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ABSTRACT To test whether the property of medium-chain fatty acids (which have 6–12 carbon atoms) being incorporated only in small amounts into the various tissues of a living organism could be exploited to treat obesity, genetically obese Zucker rats and their lean littermates were fed a diet containing 20% medium-chain triacylglycerols (MCT) or long-chain triacylglycerols (LCT) for 10 weeks. MCT, as compared with LCT, had the following effects: 1) MCT did not diminish weight gain in either the nonobese or the obese rats; 2) they increased ketogenesis more in the former than in the latter; 3) they increased the concentration of triacylglycerols in the liver of the obese rats but not of the lean ones; 4) they decreased the concentration of cholesterol in the liver of the lean but not of the obese rats, and 5) they did not particularly affect the concentration of proteins, glucose and insulin in the blood. We therefore conclude that the influence of the genotype is much more important in the establishment of the biochemical characteristics of rats than is the nature of the fatty acids ingested. Replacing LCT in the diet with MCT did not correct any of the major metabolic disorders in obese rats and therefore cannot unaided constitute a solution to the problem of genetic obesity. J. Nutr. *110:* 686–696, 1980.

INDEXING KEY WORDS medium- and long-chain triacylglycerols · diet · Zucker rats · blood · liver · lipids · metabolites

The chain length of fatty acids is essential in determining their fate in the living organism. Long-chain fatty acids (which have more than 12 carbon atoms) are abundantly incorporated into the lipids synthetized by hepatic, intestinal and adipose tissues (1), whereas medium-chain fatty acids (which have 6–12 carbon atoms) are incorporated only in small amounts and are mainly oxidized in the liver.

This difference has prompted many studies that demonstrated the advantage of replacing long-chain triacylglycerols (LCT) with medium-chain triacylglycerols (MCT) in various disorders of lipid absorption and transport (1). Although Schön et al. (2) suggested as early as 1959 that obesity might be treated by exploiting the low level of incorporation of medium-chain fatty acids into tissues, particularly into adipose tissue, this property of MCT has been studied very little (3, 4). We decided to make such a study, using the genetically obese Zucker rat (5) which is a good model for studies of obesity.

Zucker rats were fed diets with a high MCT or LCT content to see whether MCT reduced the exaggerated weight gain of these animals and prevented them from

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accumulating excessive amounts of lipids particularly in the liver and blood.

MATERIALS AND METHODS

Animals. Male Zucker rats (Centre de Sélection et d'Elevage d'Animaux de Laboratoire, Orléan-La-Source, France), 30 obese (fa/fa) and 30 lean (Fa/fa or Fa/Fa, here represented by Fa/-), arrived in the laboratory at age 5–6 weeks.

Diets. Three groups of 20 rats each (10 obese and 10 lean) were each fed one of two high-lipid diets or a control diet containing 2% lipids. Table 1 shows the composition of the three diets. The two high-lipid diets both consisted of 20% (by weight) lipids, of which 2% was sunflower oil given because of its high content of essential fatty acids. Sunflower oil provided the only lipids in the control diet. In the experimental diets, two other types of fat were also given: peanut oil, LCT ($C_{16:0}$, 12.4%; $C_{18:0}$, 3.4%; $C_{18:1}$, 59.0%; $C_{18:2}$, 21.1%; $C_{18:3}$, 1.6%; $C_{20:0}$, 0.9%; $C_{20:4}$, 1.6%) and MCT ($C_{8:0}$, 70.8%; $C_{10:0}$, 29.2%). The rats drank (acidulated tap water) and ate ad libitum.

In the course of our experiment it became apparent that the diet fed to our animals was likely low in zinc. However, the unusually high amount of this element in the drinking water (table 1) was probably sufficient to prevent zinc deficiency. Such a deficiency might have caused a significant reduction in cholesterolemia (6) and, in extreme cases, a fall in daily food intake and body weight gain.[3] Tables 2, 3 and 4 show that the values of these parameters are comparable to those generally considered normal.

Experimental design. The rats' weight gain and food intake were recorded for 10 weeks. During weeks 11 and 12, six non-fasting rats (one from each series) were decapitated between 0900 and 1000 hours every day.

Blood. Blood was collected over a funnel into a cold centrifuge tube containing 50 µl heparin (Laboratoire Choay, Paris, France). After shaking the mixture gently, we removed 300 µl blood and centrifuged the rest at 2,500 × *g* for 5 minutes.

The 300 µl of whole blood was rapidly added to 1.1 ml of ice-cold 0.5 M $HClO_4$. After shaking and centrifuging this mixture, 1.1 ml supernatant was neutralized by adding first 110 µl 7 M KOH and then powdered $KHCO_3$ as required. The extract was left in the cold for 20 minutes and then centrifuged to eliminate the $KClO_4$ precipitate.

Liver. Within 10 seconds after the rat's decapitation, while it was still being bled, an approximately 2 g piece of liver was freeze-clamped between cold aluminium

TABLE 1

Composition of the diets

	Control	MCT	LCT
	g/100 g of diet		
Fat:			
MCT[1]		18	
LCT (peanut oil)[2]			18
Sunflower oil[2]	2	2	2
Casein[3]	25	25	25
Corn starch[4]	62	44	44
Vitamin fortification mixture (in glucose)[5]	2	2	2
Fiber[6]	5	5	5
Salt mixture (USP XVII)[7]	4	4	4
Kcal/100 g diet	373	450	463

[1] The energy yield of MCT is 8.3 kcal/g. Astra-Calvé, Paris-La-Défense, France. [2] Société des Produits Bertrand, Grigny, France. [3] Monnet S. A., Paris, France. [4] L. Pietrement, Gerres, France. [5] Vitamin mixture in dextrose: (g/kg mixture), alpha tocopherol, 5; L-ascorbic acid, 45; choline chloride, 75; D-calcium pantothenate, 3; I-inositol, 5; menadione, 2.25; niacin, 4.5; PABA, 5; pyridoxine HCl, 1; riboflavin, 1; thiamin HCl, 1; biotin, 0.020; folic acid, 0.090; vitamin B-12, 0.00135; retinyl acetate, 900,000 units; ergo-calciférol 100,000 units. ICN Nutritional Biochemicals, Cleveland, OH. [6] Alphacel, ICN Nutritional Biochemicals, Cleveland, OH. [7] Salt mixture: (g/kg) ammonium alum, 0.57; cupric sulfate, 0.48; ferric ammonium citrate, 94.33; manganese sulfate, 1.24; potassium iodide, 0.25; sodium fluoride, 3.13; calcium carbonate, 68.6; calcium citrate, 308.3; calcium biphosphate, 112.8; magnesium carbonate, 35.2; magnesium sulfate, 38.3; potassium chloride, 124.7; dibasic potassium phosphate, 218.8; sodium chloride, 77.1. No zinc was added to the mix. Tap water (43 µmole/liter) and other dietary components were relied upon to supply zinc. Mix obtained from ICN Nutritional Biochemicals, Cleveland, OH.

[3] Chesters, J. K. (1975) Food intake control in zinc-deficient rats of the Zucker-Zucker strain. Proc. Nutr. Soc. *34*, 103A–104A.

TABLE 2

Effect of diet on body liver weight and on food intake[1]

Rats		Body weight Day 0	Body weight Day 70	Food intake	Liver weight	
				kcal/rat/day	*g*	*g/100 g rat*
Non-obese (Fa/—)	Control	104± 4	364± 5	68±5	13.6±0.4	3.5±0.1
	MCT	103± 4	347±12	73±4	12.7±0.5[a]	3.5±0.1[b]
	LCT	112± 5	369±10	77±3	12.5±0.4[a]	3.2±0.1[a]
Obese (fa/fa)	Control	147± 8*	539± 8*	109±2*	26.0±0.9*	4.6±0.1*
	MCT	140±10*	521±11*	113±3*	23.6±0.6*,[a]	4.3±0.1*
	LCT	140±10*	544±10*	113±4*	23.9±1.1*,[a]	4.2±0.1*

[1] Results are expressed as means±SEM (N = 10). Differences tested by analysis of variance are designated with *, [a] or [b] when significantly different ($P < 0.05$): * obese versus non-obese fed the same diet; [a] MCT or LCT versus Control of the same phenotype; [b] MCT versus LCT of the same phenotype.

blocks. Several more pieces of liver were weighed, quickly frozen in liquid nitrogen and then stored frozen in polyethylene bags until use. From these samples total lipids were extracted with a 2:1 mixture of chloroform and methanol (v/v), the amount of water or of total proteins was determined. The rest of the liver was excised and weighed.

The freeze-clamped piece of liver was used to assay for various metabolites. It was ground under liquid nitrogen and the powder was transferred into a tared centrifuge tube and weighed. Enough ice-cold 0.5 M $HClO_4$ was added in two steps to bring the ratio of the weight of the wet liver to the volume of $HClO_4$ solution to 1:4. The rest of the liver was ground in a homogenizer (Ultra-Turrax, Janke and Kunkel, Stanlen, W. Germany); the homogenate was centrifuged and the supernatant decanted. The protein precipitate was washed once, and the washing was pooled with the first supernatant. An aliquot of the liver extract was neutralized with 7 M KOH and powdered $KHCO_3$.

Analytical methods. Using the perchloric extracts from the blood and the liver, enzymatic assays were performed for ketone bodies (7), glucose (8), citrate (9) and glycogen (10). Glycerol (Triglycerides reagent kit, Worthington, Freehold, NJ) was assayed in the plasma.

The amounts of triacylglycerols (11), phospholipids (12), and cholesterol (13) in both the plasma and the liver were determined. The concentration of free cholesterol in the plasma was calculated by substracting the amount of esterified cholesterol from the amount of total cholesterol. The concentration of non-esterified fatty acids (NEFA) was determined by Soloni and Sardina's technique (14).

The total proteins in plasma (15) and liver (16) were also determined. Plasma insulin (IRI) was assayed by radioimmunoassay (Cea-Ire-Sorin assay kit), with rat insulin (Novo Industrie Pharmaceutique, Paris, France) used as a standard.

Statistical analysis. Results were expressed as means ± SEM. Differences were tested by analysis of variance using the 5% level for statistical significance (17). The percentages of differences given in the text were calculated from the means of the various results.

RESULTS

As table 2 shows, the daily food intake and the total weight gain were approximately the same for all the animals of a given type, regardless of the diet.

Blood. The concentrations of free glycerol, non-esterified fatty acids, acetoacetate and β-hydroxybutyrate were higher in the obese than in the lean rats (table 3). Furthermore, the lean rats had higher β-hydroxybutyrate-acetoacetate ratios than did the obese ones.

In the lean rats, LCT provoked a slight but significant increase of NEFA and ketone bodies compared to controls. A sim-

TABLE 3

Effect of diet on blood biochemical parameters[1]

Rats		Blood β-OHB	Blood AcAc	Blood total Ketone bodies	βOHB/AcAc	Blood glucose	Plasma immuno-reactive insulin	Plasma free glycerol	Plasma NEFA	Plasma total proteins
		nmole/ml	*nmole/ml*	*nmole/ml*		*nmole/ml*	*ng/ml*	*nmole/ml*	*nmole/ml*	*mg/ml*
Non-obese (Fa/—)	Control	52 ± 3	40 ± 4	93 ± 3	1.4 ± 0.2	6672 ± 260	1.8 ± 0.2	121 ± 32	113 ± 10	67.9 ± 0.4
	MCT	126 ± 14[a,b]	83 ± 6[a,b]	209 ± 18[a,b]	1.5 ± 0.1	6876 ± 240	2.4 ± 0.4	217 ± 34[a,b]	129 ± 21	66.6 ± 0.7
	LCT	67 ± 7	53 ± 5[a]	124 ± 11[a]	1.3 ± 0.1	7057 ± 191	2.1 ± 0.3	131 ± 19	192 ± 19[a]	64.3 ± 1.5
Obese (fa/fa)	Control	74 ± 7*	70 ± 5*	144 ± 8*	1.1 ± 0.2*	7444 ± 327*	11.0 ± 0.5*	413 ± 39*	613 ± 71*	78.4 ± 1.5*
	MCT	170 ± 19*[a,b]	137 ± 12*[a,b]	306 ± 29*[a,b]	1.3 ± 0.1*	7714 ± 203*	11.0 ± 0.8*	474 ± 72*	650 ± 67*	81.3 ± 1.4*
	LCT	89 ± 7*	81 ± 7*	170 ± 12*	1.1 ± 0.1*	7629 ± 245*	12.4 ± 0.6*	436 ± 45*	640 ± 58*	83.2 ± 1.8*

[1] Results are expressed as means ± SEM (N = 10). Differences tested by analysis of variance are designated with *, [a] or [b] when significantly different ($P < 0.05$): *obese versus non-obese fed the same diet; [a]MCT or LCT versus Control of the same phenotype; [b]MCT versus LCT of the same phenotype. The nonesterified fatty acids (NEFA) are expressed as palmitic acid; β-OHB, β-hydroxybutyrate; AcAc, acetoacetate. The term "total ketone bodies" refers to the sum of acetoacetate + β-hydroxybutyrate. 1 ng IRI is roughly equivalent to 20.7 μU.

ilar but not statistically significant tendency was observed in the obese animals. The MCT diet provoked a slight increase of glycerol concentration in plasma and a strong increase of ketonemia.

The obese rats had slightly more glucose and much more insulin in their blood than did the lean ones, but diet did not discernibly influence the levels of these substances (table 3). The plasma of the obese rats contained more total lipids than that of the lean rats (table 4) and more of each lipid fraction. The high-fat diets did not affect the concentrations of triacylglycerols in the lean rats but significantly increased them in the obese rats. The high-fat diets decreased esterified and total cholesterol in the obese animals.

Liver. The livers of the obese rats weighed more (table 2) and the concentrations of water, proteins and citrate were lower, while those of lipids, triacylglycerols and cholesterol were, respectively, higher, much higher and slightly higher than in the lean rats (tables 5 and 6).

The diets had almost no effect on the hepatic concentrations of protein and glycogen (table 5). In the lean rats LCT increased the triacylglycerols and cholesterol, whereas in the obese rats the high-lipid diet decreased the concentration of triacylglycerols and the total cholesterol. Phospholipids remained unchanged whatever the diet.

The obese animals had more β-hydroxybutyrate and less citrate per gram of liver than did the lean ones (table 5). The MCT diet was associated with an increase in the amount of β-hydroxybutyrate in the liver.

DISCUSSION

Under each heading in this section, we first discuss the results obtained with lean Zucker rats in the light of present knowledge of LCT and MCT metabolism. Then we analyze the results obtained with obese rats, considering their particular pathology.

Food intake and weight gain. The nature of the lipids in the diets did not seem to influence the amount of food taken by the lean Zucker rats (table 2). In other studies, albino rats fed MCT ate, variously, more than (3), as much as (19) or less than

TABLE 4

Effect of diet on plasma lipids[1]

Rats		Total lipids[2]	Triacyl-glycerols[3]	Total cholesterol	Free cholesterol[4]	Esterified cholesterol	Esterified cholesterol × 100/ Total cholesterol	Phospho-lipids[3]	Triacyl-glycerols/ phospho-lipids	Total cholesterol/ phospho-lipids
		mg/ml	*mg/ml*	*mg/ml*	*mg/ml*	*mg/ml*		*mg/ml*		
Non-obese (Fa/—)	Control	4.87±0.23	1.11±0.18	1.14±0.05	0.28±0.03	0.89±0.03	76±2	1.97±0.10	0.5±0.1	0.6±0.1
	MCT	4.64±0.27	1.14±0.11	1.02±0.07	0.29±0.04	0.76±0.05[a]	73±2	1.92±0.13	0.6±0.1	0.5±0.1
	LCT	4.68±0.30	1.01±0.19	1.15±0.05	0.24±0.03	0.91±0.05	79±2	1.90±0.12	0.5±0.1	0.6±0.1
Obese (fa/fa)	Control	12.54±0.82*	4.13±0.63*	2.67±0.13*	0.62±0.09*	2.05±0.09*	77±2	4.31±0.18*	1.0±0.1*	0.6±0.1
	MCT	15.37±1.11*,[a]	6.61±0.95*,[a]	2.39±0.16*,[a]	0.72±0.14*	1.74±0.06*,[a]	72±2	4.41±0.15*	1.5±0.1*,[a]	0.5±0.1
	LCT	14.55±1.31*	6.35±0.91*,[a]	2.31±0.15*,[a]	0.57±0.07*	1.74±0.10*,[a]	76±2	4.66±0.25*	1.4±0.1*,[a]	0.5±0.1*

[1] Results are expressed as means±SEM (N = 10). Differences tested by analysis of variance are designated with *, [a] or [b] when significantly different ($P < 0.05$): *obese versus nonobese fed the same diet; [a]MCT or LCT versus Control of the same phenotype; [b]MCT versus LCT of the same phenotype. [2] Total lipids = triacylglycerols + esterified cholesterol × 1.7 + free cholesterol + phospholipids (18). [3] Triacylglycerols are expressed as equivalent amounts of trioleoylglycerol, and phospholipids as equivalent amounts of lecithin. [4] Free cholesterol was calculated from the difference between total and esterified cholesterol.

TABLE 5

Effect of diet on liver composition[1]

		Water		Proteins		Glycogen		β-Hydroxybutyrate		Citrate	
		mg/g liver	*g/liver*	*mg/g liver*	*g/liver*	*mg/g liver*	*g/liver*	*nmole/g liver*	*μmole/liver*	*nmole/g liver*	*μmole/liver*
Non-obese (Fa/—)	Control	684 ± 3	9.28 ± 0.22	189 ± 2	2.57 ± 0.07	61.5 ± 4.6	0.83 ± 0.06	138 ± 14	1.84 ± 0.16	293 ± 35	3.98 ± 0.49
	MCT	682 ± 4	8.69 ± 0.33[a]	191 ± 3	2.43 ± 0.08	54.9 ± 2.5	0.71 ± 0.04	453 ± 60[a,b]	5.83 ± 0.85[a,b]	320 ± 45	4.01 ± 0.57
	LCT	683 ± 9	8.49 ± 0.32[a]	192 ± 5	2.30 ± 0.10	58.4 ± 3.8	0.72 ± 0.06	218 ± 18	2.60 ± 0.23	305 ± 41	3.72 ± 0.51
Obese (fa/fa)	Control	620 ± 10*	16.10 ± 0.53*	168 ± 5*	4.29 ± 0.19	55.0 ± 4.2	1.42 ± 0.09*	216 ± 19*	5.56 ± 0.47*	167 ± 20*	4.32 ± 0.54
	MCT	648 ± 3*,[a]	15.28 ± 0.38*	179 ± 4*	4.22 ± 0.12	53.4 ± 3.3	1.25 ± 0.08*	452 ± 50[a,b]	10.67 ± 1.22*,[a,b]	200 ± 38*	4.63 ± 0.87
	LCT	661 ± 4*,[a]	15.56 ± 0.85*	176 ± 3*	4.20 ± 0.19*	57.3 ± 3.9	1.36 ± 0.10*	259 ± 11	6.18 ± 0.38*	193 ± 30*	4.49 ± 0.65

[1] Results are expressed as means ± SEM (N = 10). Differences tested by analysis of variance are designated with *, [a] or [b] when significantly different ($P < 0.05$): * obese versus nonobese fed the same diet; [a]MCT or LCT versus Control of the same phenotype; [b]MCT versus LCT of the same phenotype. Total proteins were obtained from N × 6.25. Glycogen is expressed as the equivalent number of glucosyl units determined. Acetoacetate was not determined.

TABLE 6

Effect of diet on liver lipid composition[1]

		Total lipids		Triacylglycerols		Triacyl-glycerols ×100/ total lipids	Total cholesterol		Phospholipids		Total cholesterol/ phospholipids
		mg/g liver	*g/liver*	*mg/g liver*	*mg/liver*		*mg/g liver*	*mg/liver*	*mg/g liver*	*mg/liver*	
Non-obese (Fa/—)	Control	40 ± 2	0.54 ± 0.03	7.09 ± 0.46	95 ± 5	16 ± 1	2.14 ± 0.04	29 ± 1	33.14 ± 0.77	448 ± 13	0.07 ± 0.01
	MCT	47 ± 1[a]	0.60 ± 0.04	8.15 ± 0.81	101 ± 10[b]	17 ± 1[b]	2.15 ± 0.05[b]	27 ± 1[b]	37.23 ± 0.94	470 ± 8	0.06 ± 0.01[a,b]
	LCT	50 ± 1[a]	0.63 ± 0.02	12.66 ± 1.58[a]	148 ± 17[a]	24 ± 2[a]	2.85 ± 0.15[a]	34 ± 2[a]	35.08 ± 0.96	422 ± 24	0.08 ± 0.01[a]
Obese (fa/fa)	Control	133 ± 14*	3.52 ± 0.45*	77.01 ± 8.77*	2,025 ± 262	67 ± 3*	3.11 ± 0.16*	80 ± 4*	29.80 ± 1.35*	768 ± 28*	0.11 ± 0.01*
	MCT	99 ± 6*	2.35 ± 0.19*	54.27 ± 5.14*,[a,b]	1,330 ± 114*,[a,b]	59 ± 3*,[a,b]	2.76 ± 0.06*	65 ± 3*,[a]	31.93 ± 1.23*	751 ± 28*	0.09 ± 0.01*,[a]
	LCT	82 ± 4*,[a]	1.96 ± 0.11*,[a]	38.99 ± 3.93*,[a]	914 ± 92*,[a]	49 ± 3*,[a]	2.69 ± 0.12	64 ± 3*,[a]	34.18 ± 1.08	814 ± 40*	0.08 ± 0.01[a]

[1] Results are expressed as means ± SEM (N = 10). Differences tested by analysis of variance are designated with *, a or b when significantly different ($P < 0.05$); *, obese versus nonobese fed the same diet; [a]MCT or LCT versus control of the same phenotype; [b]MCT versus LCT of the same phenotype. Triacylglycerols are expressed as equivalent amounts of trioleoylglycerol, and phospholipids as equivalent amounts of lecithin. Lipid contents were obtained by weighing after chloroform/methanol extraction.

(20) those fed LCT. In contrast to albino rats (3, 20–22), the Zucker rats we studied showed no slowing of weight gain under the influence of the MCT diet.

The obese rats naturally ate and grew more than the lean ones did (table 2), but here again, the nature of the lipids in the diet did not seem to have any effect.

The feasibility of replacing dietary LCT with MCT is now well established (2–4, 23–27). The Zucker rat, whether lean or obese, is no exception: the MCT diet was very well tolerated and caused no noticeable disorders or deficiencies. This is fairly surprising considering that the metabolism of MCT differs greatly from that of the LCT usually provided in the diet. The first difference to appear between the two types of fats is in their absorption, as discussed below.

Non-esterified fatty acids and free glycerol in plasma. In contrast to LCT, MCT are completely hydrolyzed in the intestine. The fatty acids liberated are not re-esterified into triacylglycerols, but we transported via the portal system directly to the liver. All these differences should naturally show up in the plasma as an increase in the concentration of long-chain NEFA (27) when the diet contains LCT and as an increase in free glycerol when the diet contains MCT. That was the case in the lean Zucker rats (table 3) but not in the obese. One could, however, argue that in the latter, the high values of NEFA and of endogenous glycerol due to accelerated lipolysis and turnover (28) eclipse the additional NEFA and glycerol provided by the LCT and MCT diets, respectively.

Ketogenesis. The fate of fatty acids in the liver depends on the length of their chain. In a fed living organism, the long-chain fatty acids are abundantly incorporated into the lipid synthesized in the liver, whereas the medium-chain fatty acids are almost all oxidized (29, 30).

In the lean Zucker rats, the high-lipid diets resulted in higher ketone-body levels than did the control diet (slightly higher for LCT and much higher for MCT). This was observed both in the liver (table 5) where β-hydroxybutyrate increased with MCT by 228% and perhaps also with LCT (+58%, not significant [NS]), and in the blood (table 3) with increases in acetoacetate (by 107% with MCT versus 33% with LCT) and in β-hydroxybutyrate (+142% with MCT versus +29% [NS] with LCT).

Thenen and Mayer (31) showed that obese rats oxidize fats less than lean ones do. On the other hand, Malewiak et al (32) demonstrated that an LCT-rich diet has less ketogenic effect in obese Zucker rats than in their lean controls. And we have shown earlier (33) that a single oral MCT load resulted in a lower ketonemia in the obese Zucker rat than in its lean counterpart. The present study shows that after 10 weeks of the diet, the change in ketone-body levels was smaller in the obese than in the lean rats. In the livers of rats fed LCT (table 5), β-hydroxybutyrate concentrations in the lean rats was 58% higher than the control level, but in the obese rats it was only 20% higher. Neither increase, however, was statistically significant. A similar difference between the values for the two groups was observed with MCT: a 228% increase in the lean versus 109% in the obese rats. The results of the blood analyses were less clear-cut, however (table 3): total ketone-body concentrations exceeded control levels by 33 or 125% (with LCT and MCT, respectively) in the lean rats versus 18 (NS) and 113%, respectively, in the obese rats. Over a long enough experimental period, the difference between the response in the liver and that in blood to the increase in ketogenesis is probably due to an adjustment of the consumption of ketone bodies by the peripheral tissues (34).

Lipids. Earlier studies on albino rats have shown that liver lipogenesis reaches a maximum with a sugar-rich diet and decreases markedly with a diet that supplies lipids, and that the effect is much more marked with LCT than with MCT (19, 20, 35, 36). Thus, the inclusion of LCT or MCT in the diet of albino rats lowers the activity of the citrate cleavage enzyme (19) and causes an accumulation of citrate (23), a precursor of lipids in the liver.

In the lean Zucker rats, the fatty diet did not change the concentration of citrate,

in the liver (table 5). High-lipid diets nevertheless resulted in an increase in total lipid concentrations in the liver (table 6) without any consequent effect on the concentration of lipids in the blood (table 4).

Compared to the nonobese, the obese rats showed a marked increase in the concentration of total lipids in both the liver (table 6) and plasma (table 4), caused by the increased hepatic lipogenesis (37–39). There was an accompanying decrease in the amount of citrate per gram of liver (table 5). Here again, the nature of the lipids administered did not seem to influence the liver citrate.

Triacylglycerols. In the livers of the lean Zucker rats (table 6), the MCT-containing diet resulted in triacylglycerol concentrations similar to those found in the control and LCT groups while the total amounts of triacylglycerols were highest with LCT. In the plasma, however, the triacylglycerol levels were the same with all the diets. Although our results are comparable with those of Demarne et al. (25), Takase et al. (24) obtained the opposite results with Wistar rats in experimental conditions resembling ours, whereas Wiley and Leveille (20) found that MCT induced lower plasma concentrations of triacylglycerols than did LCT.

The triacylglycerols are the lipid fraction that was most different in the lean and the obese rats, both in the liver (table 6) and in the blood (table 4). They constituted 16–24% and 49–67% (depending on the diet) of the total hepatic lipids of lean and obese rats, respectively, and 22–25% and 33–47%, respectively, in the blood. Among the obese rats, the hepatic triacylglycerol concentrations were highest in the control group and lowest in the LCT-fed group, and the plasma concentrations of triacylglycerols were similar in the LCT and MCT group (table 4).

Among animals fed the same diet, triacylglyceremia was higher in the obese than in the lean rats—270% higher in the control group, 480% in the MCT group and 530% in the LCT group. Both high-lipid diets thus resulted in an additional increase in the plasma triacylglycerol concentration. The order was reversed as regards the results for the liver, the increase in obese rats being 986% for the control group, 566% for the MCT group and 208% for the LCT group. When the analysis was extended to the whole organ, the increase became 2,021% for the control group, 1,205% for the MCT group and 518% for the LCT group.

Phospholipids. We found, as did Harkins and Sarett (21), that the diet did not affect phospholipid concentrations in the liver (table 6) or in plasma (table 4). This was expected, since medium-chain fatty acids are not incorporated into phospholipids (1). But a curious difference appeared between the lean and the obese rats; the latter had much higher concentrations of phospholipids in the plasma (+119% to +145% higher, depending on the subgroup) but practically unchanged hepatic concentrations (−3% to −14%, NS). Here again, the diet had no effect.

The ratio of triacylglycerols to phospholipids (table 4), which seems to be related to the degree of turbidity of the serum, was significantly higher in the obese rats. Furthermore, when the increase in triacylglycerols is taken into account, the ratio is higher in the group fed a fatty diet than in the control group.

Cholesterol. Most authors (4, 21, 22, 24, 40–42), although not all (23, 27), agree that MCT lower the plasma cholesterol concentration. In lean Zucker rats, we found (table 6) that MCT resulted in lower liver levels of cholesterol than did LCT but that it did not significantly decrease the plasma total cholesterol concentration (table 4).

A lack of unsaturated long-chain fatty acids, which can esterify cholesterol, has been suggested as the reason why MCT decreases cholesterolemia (43). This hypothesis is supported by our observation that when LCT were replaced by MCT the plasma concentration of esterified cholesterol was lower in the lean MCT rats (table 4). In addition, the hepatic synthesis of cholesterol from acetate in vivo is lower with MCT than with LCT (24, 41, 42, 44).

In our study, the obese rats had high levels of both free and esterified cholesterol (table 4). Both of the fatty diets resulted

in lower cholesterol concentrations in liver and plasma than did the low-lipid diet, but in this case the two fatty diets had the same effect.

Glucose and insulin. Wiley and Leveille (20) reported an increase of insulinemia in the Wistar rat fed a LCT- or and MCT-rich diet. In the lean Zucker rat, we found no dietary influence on insulinemia, glycemia (table 3) or liver glycogen (table 5).

We found in obese rats the slight hyperglycemia and the marked hyperinsulinemia encounted in all genetically obese rodents (37). The nature of the dietary lipids did not seem to introduce changes in addition to those related to the genotype (table 3). Bryce et al. (45), Lemonnier et al. (46), Malewiak et al. (32) and Lavau and Hashim (19) reported that a diet rich in LCT did not change the IRI or glucose concentrations in the plasma of obese Zucker rats.

Proteins. Tables 3 and 5 show that the length of the fatty acid chains in the diet does not seem to affect the levels of total proteins in the liver or the plasma of lean Zucker rats. Harkins and Sarett (21), who also administered diets containing various fats including MCT, found no changes in the protein contents of the animals' carcasses.

We found that in obese rats the concentrations of proteins were increased in plasma but decreased in the liver. The work of Fillios and Saito (47) established that despite increased hepatic protein synthesis in obese Zucker rats, the hepatic concentration of proteins is lower in those rats than in their lean littermates. The diets had no effect on protein concentrations in plasma or liver.

In conclusion, there was little difference between the MCT- and the LCT-fed rats. In the lean rats, MCT caused an increase in blood glycerol, an increase in circulating ketone bodies and a decrease in hepatic cholesterol and triacylglycerols.

The increase in ketogenesis was more moderate in the obese MCT-fed rats than in the lean ones. Furthermore, in obese rats, the liver triacylglycerol levels increased while cholesterol remained unchanged.

It is thus likely that the fate of acetyl-CoA resulting from MCT oxidation is different in the two types of rats. In lean ones, it is directed mainly toward ketogenesis, and in the obese, probably more toward anabolic pathways. The genotype (fa/fa or Fa/-) thus influences biochemical characteristics much more strongly than does the nature of the fatty acids in the diet.

Consequently, the hope that MCT might slow down weight gain and diminish lipids, especially cholesterol, is realized only weakly in lean rats and hardly at all in obese ones. None of the major metabolic disorders of obesity studied here were really corrected by substituting MCT for LCT. Therefore, we believe that MCT alone cannot provide a solution, even a partial one, to genetically determined obesity.

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【書類名】　明細書

【発明の名称】　油脂組成物

【特許請求の範囲】

【請求項１】　主としてトリグリセリドからなる油脂組成物であって、油脂組成物を構成する全脂肪酸に占める中鎖脂肪酸の割合が５～２３重量%で、かつ全トリグリセリドに占める、中鎖脂肪酸残基を分子内に２つ有するトリグリセリドの割合が１～２０重量%であることを特徴とする油脂組成物。

【請求項２】　中鎖脂肪酸が炭素数６～１２の飽和脂肪酸である請求項１記載の油脂組成物。

【請求項３】　油脂組成物を構成する全トリグリセリドに占める、中鎖脂肪酸残基を分子内に３つ有するトリグリセリドの割合が３重量%以下である請求項１または２記載の油脂組成物。

【請求項４】　油脂組成物を構成する全長鎖脂肪酸に占める長鎖飽和脂肪酸の割合が２０重量%以下である請求項１～３のいずれかに記載の油脂組成物。

【請求項５】　請求項１～４のいずれかに記載の油脂組成物を含有する調理用油脂組成物。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】

本発明は食用に供される油脂組成物に関する。さらに詳しくは体脂肪蓄積が少なく、かつ食用油としての調理適性と風味に優れた油脂組成物に関する。

【０００２】

【従来の技術】

肥満は体脂肪が過剰に蓄積した状態であり、糖尿病、高脂血症などの代謝異常や高血圧、虚血性心疾患など循環器疾患を始めとして、多くの疾病を伴いやすいことはよく知られている。厚生省が行っている国民栄養調査の結果によれば、成人の７人に１人は肥満者であることから、肥満は欧米だけでなく我が国においても身近な問題である。食事中に含まれる脂肪は、体脂肪の蓄積と最も関係の深い栄養素の１つであり、過剰な脂肪の摂取は肥満をもたらす可能性がある。しか

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was cracked by the severe earthquake.

2 [比喩的に] ¶～ようなかっさい a storm [thunder, volley] of applause ; an avalanche of cheers. ¶仲間と～ split with one's partners.

¶票は3つに割れた. The total vote was split three ways. ¶党が幾つにも割れた. The party split [was rent] into several fractions. ¶頭が～ように痛い. I have a racking [splitting] headache. / My head is splitting.

wa|re-saki-ni 我先に *phr.* =***ware-gachi-ni***.

wa|re-shirazu 我知らず *ad.* in spite of oneself ; unconsciously ; unwittingly ; involuntarily ; instinctively.

wa|re-ware 我々 *pron.* we. ¶～日本人 we Japanese. ¶～集団[社会]the in-[we-]group. ¶～の our. ¶～に[を] us. ¶～のもの ours.

wa|re-yasu|i 割れ易い *a.* brittle ; fragile ; perishable ; easily cracked [split]. ¶このコップは～. This glass is brittle.

wa|ri 割 *n.* **1** [割合] rate ; proportion ; ratio. [=***wariai***] ¶営業[戸数, 地租]～ business [house, land] rate. ¶...の～に ⇨ ***wariai-ni*** 1, ***wari-ni*** 2.

[割で] 1日100円の～で at the rate of 100 yen a day. ¶千人に1人の～で in the ratio of one to a thousand persons ; one for every one thousand persons.

¶各人俸給～で義捐(ぇん)した. Each contributed to the relief fund in proportion to the salary he drew. ¶君の会社は月給の～がよい. Your company pays relatively good salaries.

2 [百分率の] percentage. ¶1～ ten percent [per cent] ; 10%. ¶年1～3分の利子 an interest of 13 percent per annum.

¶その額はわが貿易総額の1～5分になる. It accounts for [makes up, constitutes, represents] 15 percent of the sum total of our trade. ¶それ以来物価は約2～方騰貴している. The prices have risen by about 20 percent since then. ¶生徒の何～が欠席しましたか. What percentage of children were absent?

3 [利益] profit ; gain. ¶～を食う be put at a disadvantage ; get the short end of the stick ; get the worst of the bargain.

[割りの] ～のいい[職業など] remunerative ; lucrative ; paying ; [取引など] profitable ; [位置など] advantageous. ¶～の悪い unprofitable ; unremunerative ; disadvantageous.

[割りに] ～に合う pay ; 《米》pay off. ¶～に合う商売 a paying business. ¶～に合わない do not pay ; 《米》do not pay off. ¶～に合わない仕事 ill-paid work ; [感謝されない] a thankless task [job].

¶この商売は～がよい. This business pays well. ¶流暢な英語が話せないという点で日本人は～が悪い. The Japanese are at a disadvantage in being unable to speak fluent English. ¶そんなことをしても～に合わない. It does not pay off. / It is not worth while [the trouble]. ¶学校に教えに行くより弟子を取る方が～がいい. It would pay you better to take pupils than to teach at school. ¶君の方が～がいい. You have a better chance. ¶養豚は当節～に合わない. Pigs are now hardly worth their keep. ¶その仕事は～に合わない. The game is not worth the candle. [諺]

4 [割り当て] allotment ; assignment. ¶頭～で per head [capita]. ¶場所～ an assignment of place. ¶場所～をする allot place 《to》.

wa|riai 割合 **1** *n.* [比率] rate ; proportion ; ratio ; percentage (百分比).

[割合で] ...の～で at the rate of ; in the ratio of ; on the basis of. ¶3に1の～で in the ratio [proportion] of three to one ; in the 3:1 ratio. ¶1キロ50円の～で at the rate of 50 yen a kilogram.

¶1日平均100円の～となる. It will work out at 100 yen per day. ¶甲は乙に対してどんな～になっているか. What ratio does A bear to B? ¶甲は乙に対して10と2との～だ. The ratio of A to B is 10 to 2. / A and B are in the ratio (of) 10 : 2. ¶ある種の物質はどんな～にでも自由に混合する. Certain substances will mix freely in any proportion.

2 *ad.* [比較的] [=***wariai-ni***] ¶～うまく行く go [get] on rather well [favorably, beautifully]. ¶～平気で別れる leave each other without much sorrow.

wa|riai-ni 割合に *phr.* comparatively ; in comparison ; relatively. [=***wari-ni***] ¶年の～ for [considering] one's age [years].

¶彼は偉い～有名でない. His reputation is not in proportion to his greatness. ¶彼は年の～気が若い. He is young in spirit for his age. ¶この帽子は～安い. This hat is rather cheap. ¶父の病気は～軽い. My father is not so seriously ill as he appears to be.

wa|ri-ate 割り当て *n.* assignment ; allotment ; allocation ; apportionment ; quota ; [分配] division ; distribution ; [賦課] assessment ; [配給] rationing ; [仕事の] one's stint. ¶按分～ *pro rata* allotment. ¶事前～ pre-allocation. ¶～配給 quota delivery ; rationing. ¶～法[数・統計] a quota method. ¶～完了 completion of one's quota. ¶～金 allotment ; [賦課金] assessment. ¶～切符 an allocation ticket [certificate]. ¶～量[額] a quota ; an allotment ; a stint. ¶電力～量 an allocated amount of power. ¶供出～量 a delivery quota. ¶石炭の～量 an alloted quota of coal. ¶～制[計画] a quota system [program]. ¶～制限 quota restrictions. ¶～周波数 the assigned frequency. ¶～通知 an allotment letter [notice] ; a letter of allotment. ¶～受け人 an allottee. ¶～量を果たす fulfil the quota. ¶～量を削減する cut the quota. ¶宿舎の～がなかなか困難であった. It was very difficult to quarter them.

wa|ri-ate|ru 割り当てる *v.* [分配する] assign ; allot ; allocate ; apportion ; parcel [map] out ; divide between [among] ; distribute among ; [按分して] prorate ; [賦課する] assess. ¶めいめいに～ allot a share to each. ¶宿舎を～[軍] billet (soldiers on houses). ¶(ホテルなどで)部屋を～ assign rooms (to persons). ¶役を～ assign a role (to each actor) ; cast the parts (to the actors). ¶仕事を～ assign (a person) for a task ; assign a task to (a person). ¶時間を～ divide [map out, plot out] one's time.

¶委員にそれぞれ仕事を割り当てた. I assigned the tasks to the committee. ¶100万円私の局に割り当てられた. One million yen was allotted to our bureau.

wa|riba|shi 割り箸 *n.* half-split [splittable] chopsticks.

wa|ri-beruto-gu|ruma 割ベルト車 *n.* [機] a split pulley.

wa|ribiki 割引 *n.* (a) discount ; (a) reduction ; (an) allowance ; price cutting. ¶団体～ a party-trip reduction. ¶現金～ (a) cash discount. ¶銀行～ bank [banker's] discount. ¶仲間～ (a) trade discount [allowance]. ¶値段の～ a discount off [on] the price. ¶2～ ⇨ ***-biki***. ¶大～ =***ō-waribiki***. ¶再～ rediscount. ¶品物に対する～ a discount on an article. ¶数量～ a quantity discount. ¶手形の～ bill discount [discounting]. ¶～歩合[率] a discount rate. ¶～電車 a reduced-fare car. ¶～額 a discount. ¶～銀行 a discount bank. ¶～業者 [人] a discounter ; [店] a discount house. ¶債券を～発行する issue bonds at discount. ¶～時間 reduced fare [rate] hours. ¶～乗車券 a reduced rate [fare] ticket ; a cheap ticket. ¶～券 a discount ticket [coupon]. ¶～期間 the term of discount. ¶～小売店 a discount house. ¶手形～仲買人 a discount broker. ¶～値段 a reduced price. ¶～列車 a cheap train. ¶中央銀行～率 the discount rate ; the bank rate. ¶～料 a discount (charge, commission). ¶～債券 a discount bond. ¶～政策 a discount policy. ¶～手形 a discounted bill ; [簿] bills discounted. ¶～点数[撞球] discount. ～**suru** *v.* discount ; give [allow, make] a discount ; reduce ; give [accord, afford, grant] a reduction [an allowance] ; take [cut] off. ¶5分～する give [allow] a 5 percent discount (on [off] the price) ; reduce the price by 5 percent. ¶1ポンドにつき5ペンス～する discount 5 pence in the pound. ¶～値段で, ～して at a reduced price ; at a discount ; (米) at a cut rate. ¶手形を銀行で～してもらう get a bill discounted at a bank. ¶話を～して聞く discount a story ; take [accept] a story with a grain [pinch] of salt [some reservation, some discount, certain qualifications].

[割引を] 1割の～をする make an allowance [allow a discount] of 10 percent. ¶(普通の料金に)～をする allow a discount (off the usual rate). ¶手形の～をする discount a bill. ¶映画の～を見る see a movie shown at reduced admission prices.

¶少し～できませんか.—5分引きましょう. Can't you take off a little?—I can cut off 5 percent. ¶現金なら幾らか～しますか. Do you allow any discount for cash? / Do you make any allowance for cash payment? ¶大量なら～します. We make [You will have] a reduction on a quantity. ¶この苗は1本20円で, 何本お買いになっても, ～は致しません. These seedlings are 20 yen apiece straight. ¶彼の話は～して聞かねばならない. His story is not to be accepted at its face value. ¶宿屋は1週間滞在すれば～する. The hotel gives a reduction for a week's stay. ¶団体に対しては運賃を～する. A discount is allowed on party tickets. / They will make special terms for parties.

wa|ri-bi|ku 割り引く *v.* ⇨ ***waribiki*** (割引する).

wa|ri-bu|shin 割り普請 *n.* a construction work divided and assigned to more than one contractor.

wa|ri|-chō 割長 *n.* [日本長期信用銀行割引債券] a discount bond of the Long-Term Credit Bank of Japan.

wa|ri-chū 割註[注] *n.* inserted notes.

wa|ri-da|isu 割ダイス *n.* [機] split dies.

wa|ri-daka 割高 *n.* a comparatively high price [cost]. ～**na** *a.* comparatively high in cost [price] ; [費用が] comparatively expensive.

¶それでは～につく. That will cost us much. ¶量の割に～だ. This is rather expensive considering the quantity. / The price is high for the quantity.

wa|ri-dake 割り竹 *n.* split bamboo.

wa|ri-dashi 割り出し *n.* [機] dividing ; indexing. ¶～台 a dividing head. ¶～板 a dividing plate.

wa|ri-da|su 割り出す *v.* [算出する] calculate ; compute (at) ; [推断する] deduce [conclude] (from) ; infer (from). ¶(自分の頭から)～ invent ; devise.

¶それは一体何から割り出したのか. What did you deduce it from? / How on earth do you make that out? / What is your reasoning? ¶わが対米政策はこれから割り出してある. Our American policy is formed [based] on this.

wa|ri-fu 割り符 *n.* **1** [数取りの] a tally. ¶～にしるしをつける make a score on the tally.

2 [引き合わせの] a check.

wa|ri-fu 割り賦 *n.* =***wappu***.

wa|ri-fuda 割り札 *n.* **1** [割り符] =***wari-fu*** 割り符.

2 [割引の札] a discount tag.

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translation / 和文タイプ(ライター) a Japanese-language typewriter.

わへい 和平 peace ⇨ へいわ ¶和平の提案をする make a proposal for peace / 和平交渉 peace negotiations.

わほう 話法 〖文法〗 narration ; 《米》 discourse ; 《英》 speech ¶間接話法 ⇨ かんせつ¹ / 直接話法 ⇨ ちょくせつ.

わぼく 和睦 〈講和〉 peace ; 〈和解〉 (a) reconciliation ¶和睦する make (*one's*) peace 《with》 ; 〈和解する〉 《文》 be reconciled 《with》 ; come to terms 《with》.

わほん 和本 ⇨ わしょ.

わめきごえ 喚き声 a shout ; an outcry ; a yell ; 《文》 exclamatory noises (★ oof !, ouch !, ow ! などのような).

わめきたてる 喚き立てる ⇨ わめく.

わめく 喚く 〈大声で〉 shout ; cry ; raise *one's* voice ; yell ; give [《文》 utter] a yell ; 〈金切り声で〉 shriek ; scream ; give [let out, 《文》 utter] a scream ; 〈騒々しく〉 《文》 make an outcry ; clamor.

わやく 和訳 ¶和訳する translate [turn, 《文》 render, put] 《the English》 into Japanese / 英文和訳の問題 a passage of English set for translation into Japanese.

わようせっちゅう 和洋折衷 ¶和洋折衷の half-Japanese, half-Western 《furnishings》 ; 《a house》 in semi-European[-Western, -Japanese] style.

わら 藁 (rice) straw ; a straw (1本) ¶わらを敷く cover 《a kennel》 with straw ; litter 《a stall》 down / わらを束ねる bind [tie up] straw into a sheaf / わらでふく thatch 《a house》 with straw / わら靴 straw boots / わら細工 straw work / わら人形 a straw figure [doll, 《文》 effigy] ; a man [woman] of straw / わら灰 straw ashes / わらぶき屋根 a straw-thatched roof / わら布団 a straw mattress ; a palliasse.

わらい 笑い a laugh ; laughter ; 〈微笑〉 a smile , 〈嘲笑〉 a sneer ¶笑いを買う[招く] be laughed at 《by》 ; make *oneself* a laughingstock ; 《文》 incur derision / 笑いを押える[こらえる] suppress [repress] a laugh [smile] ; stifle *one's* laughter ; 《cannot》 help laughing ; keep a straight face ; keep *one's* face straight / 笑い顔 a smiling face / 笑い声 laughter ; a laughing voice / 笑い話 a funny story. 文例⇩

わらいぐさ 笑い草 〈物笑いの種〉 a laughingstock ; a butt of ridicule ⇨ わらいもの.

わらいこける 笑いこける roll about [be convulsed] with laughter ; be in stitches ; laugh *oneself* to death ; laugh *one's* head off.

わらいじょうご 笑い上戸 〈酒に酔うとよく笑う人〉 a laughing drunk ; a happy [merry] drinker ; 〈何かとよく笑う人〉 a person who starts laughing at the drop of a hat.

わらいだす 笑い出す burst out laughing ; burst into (a roar of) laughter. 文例⇩

わらいとばす 笑い飛ばす laugh 《*sb's* fears》 off [away].

わらいもの 笑い物 ¶笑い物になる make a laughingstock [fool] of *oneself* ; 《文》 be the butt of 《the villagers'》 ridicule. 文例⇩

わらう 笑う 〈声を出して〉 laugh ; 〈微笑する〉 smile ; 〈くすくす〉 chuckle ; giggle ; 〈歯を見せてにこっと〉 grin ; 〈にやにや〉 simper ; 〈げらげら〉 guffaw ; 〈嘲笑する〉 laugh scornfully at *sb* ; jeer [sneer] at *sb* ; 《文》 deride ¶一緒に笑う join in the laughter / 腹をかかえて笑う hold [split] *one's* sides with laughter / 腹の皮をよじって笑う be convulsed [《俗》 creased] with laughter / どっと笑う laugh uproariously ; roar with laughter / 陰で[面と向かって]笑う laugh behind *sb's* back [in *sb's* face] / 笑いながら with a laugh [smile] ; laughingly ; smilingly / 笑うべき laughable ; ridiculous ; ludicrous ; absurd. 文例⇩

わらじ 草鞋 straw sandals.

わらび 〖植〗 bracken.

ワラビー 〖動〗 a wallaby.

わらべ 童 ⇨ こども ¶わらべ歌 a children's [song.

わらわせる 笑わせる make *sb* laugh ; 《文》 excite [provoke] the laughter of 《the audience》. 文例⇩

わり(あい) 割(合) 〈率〉 a rate (★ 複数にはしない) ; 〈比率〉 a ratio 《*pl.* -s》 ; 〈百分率〉 (a) percentage ¶1割5分 15 per cent / 割りのいい 〈職業などが〉 paying ; 《文》 remunerative ; 《文》 lucrative ; 〈取り引きなどが〉 profitable / 割りを食う 〈事が主語〉 《文》 be disadvantageous to *one* ; be [turn out] to *one's* disadvantage / 1日千円の割りで at the rate of 1,000 yen a day / 千人に対して1人の割合で in a [the] ratio of one to a thousand men / 割(合)に 〈比較的〉 comparatively ; relatively ; 〈いささか〉 rather ; a little / 年の割りに for [considering] *one's* age [《文》 years] / 割りに合う pay / 割りに合わない do not pay / 割りと多くの quite a few [bit]. 文例⇩

わりあて 割り当て 《文》 (an) assignment ; a quota ; 《文》 (an) allotment ; (an) allocation ; 〈配給〉 a ration 《of food》 ¶割り当て制 the quota system / (仕事などの)割り当て分を完了する fulfill *one's* quota / 割り当て額[量] a quota ; an allotment. 文例⇩

わらう 何を笑っているのだ. What are you laughing at? / 今度はこちらが奴らを笑う番だ. We have the laugh on them this time. / 君がどんなに笑っても僕は決心を変えないぞ. You cannot laugh me out of my decision. / 笑う門には福来たる. Fortune comes to a merry home.

わらわせる あの男が大臣になりたいって, 笑わせるね. He wants to be a cabinet minister? What a joke!

わり(あい) それ以来物価は2割も上がっている. Since then prices have risen by as much as 20 per cent. / 費用は1人5千円の割りとなった. The cost worked out at 5,000 yen per [a] head. / 児童の何割が欠席しましたか. What percentage of the children were absent? / 野球の嫌いな人が割りと多いらしい. There seem to be quite a few people that dislike baseball. / 医者の話では親父の病気は割合に軽いということだ. The doctor told me that my father is not so seriously ill (as he appears to be).

わりあて すべての仕事に対して割

新 和 英 中 辞 典

第 1 版 1933 年
第 2 版 1963 年
第 3 版 1983 年

この改訂
辞書を提供
べて、英米
伝えるもの
という方針
この方針
あっても、
た。それは
かにしたい
した。
日本語に
が、国語辞
義・慣用を
書に洩れて
和英辞典
辞典は作ら
い。しかし
ミュニケー
にはならな
んに使われ
では日常英
この改訂
とであろう
したが、こ
なお、《文》
で詳しく解
域表示は、
私たちに
校正刷りの
によって、
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《on a carrier》.
チャック a zip fastener; a zipper; a zip ¶チャックを掛ける zip (up); do up a zipper / チャックを外す unzip; undo a zipper / かばんのチャックを開ける zip a bag open / チャック付きの zippered《bags》; zipper《jackets》. 文例⇩
ちゃづけ 茶漬け boiled rice with tea (poured on it); tea on rice; 〈簡単な食事〉 a simple meal.
ちゃっこう 着工 ¶着工する start (construction) work.
チャド Chad ¶チャドの Chadian / チャド共和国 the Republic of Chad / チャド人 a Chadian.
チャドル 〈回教婦人の〉 a chador.
ちゃのま 茶の間 a living room; 《米》 a parlor; 《英》 a sitting room. 文例⇩
ちゃのゆ 茶の湯 the tea ceremony.
ちゃばん 茶番《play》 a farce ¶茶番的 farcical; ridiculous; absurd.
ちゃぶだい ちゃぶ台 a low dining [tea] table.
ちゃぼ 〈鶏〉 a bantam.
ちやほや ¶ちやほやする make a fuss of; pamper; indulge; spoil《a child》.
ちゃみせ 茶店 ⇨ちゃや.
ちゃめ 茶目 〈いたずら〉 mischief; 〈いたずらもの〉 a scamp ¶茶目な 〈こっけいな〉 playful; full of play [fun]; 〈いたずらな〉 mischievous; 《文》 puckish / 茶目な顔付き an arch look / 茶目をやる play pranks.
ちゃや 茶屋 〈茶商〉 a tea store [shop], a tea dealer (人); 〈茶店〉 a teahouse.
ちゃらちゃら ¶ちゃらちゃら音がする[をさせる] jingle.
ちゃらんぽらん ¶ちゃらんぽらんを言う say irresponsible things; talk irresponsibly.
チャリティーショー a charity show.
ちゃりん 〈音〉 a clink ¶ちゃりんという clink.
チャルメラ [<《ポルトガル語》 *charamela*] a street vendor's flute.
ちゃわかい 茶話会 ⇨さわかい.
ちゃわん 茶碗 〈食事用〉 a (rice) bowl; 〈湯飲み〉 a teacup ¶茶わんに1杯 a bowlful [bowl]《of rice》.
チャンス a chance; an opportunity ¶絶好のチャンス a golden [perfect] opportunity; a chance not to be missed / 少しでもチャンスがあれば given [if *one* gets] half a chance / チャンスをうかがう wait for an [*one's*] opportunity / チャンスをつかむ seize a chance [an opportunity] / チャンスをつかんで…する seize the chance to *do*; seize *one's* chance and *do* / チャンスを逃がす lose *one's* [the] chance; miss the [*one's*] opportunity.
ちゃんちゃんこ a padded sleeveless *kimono* jacket.
ちゃんちゃらおかしい laughable; ridiculous; 《口語》《be》 a (big) joke.
ちゃんと 〈正しく〉 properly; correctly; 《文》 duly; 〈整然と〉 neatly; tidily; in good order ¶ちゃんとした職業 a proper [steady] job; a regular occupation / ちゃんとした人 a decent [an upstanding] person / ちゃんとした服装をしている be tidily [neatly] dressed / ちゃんと座る sit properly; sit up straight / ちゃんと知っている know *sth* perfectly well; know *sth* for certain [for a fact]; be well aware《of》 / ちゃんとした暮らしをする lead a decent life. 文例⇩
チャンネル a channel ¶NHK テレビ第1チャンネル NHK TV Channel 1 / チャンネルを選ぶ select channels / チャンネルを切り替える change the channel / 第6チャンネルにする turn to Channel 6 / チャンネル争い a dispute over which television program《they》 should watch / 8チャンネルのテープレコーダー an eight-track tape recorder. 文例⇩
ちゃんばら a sword battle ¶ちゃんばら映画 a *samurai* picture (with plenty of sword-fights).
チャンピオン a champion.
ちゃんぽん 〈長崎料理〉 *champon*; a dish of noodles with seafood, vegetables, etc. ¶ちゃんぽんに (all) together; mixed up / ちゃんぽんに飲む mix *one's* drinks ★mix a drink と言えば「カクテルを作る」の意 / 酒とビールをちゃんぽんに飲む mix beer and *sake*.
ちゆ 治癒《文》 healing; recovery ¶治癒する《文》 heal; recover; be cured / 治癒し得る curable / 自然治癒 spontaneous recovery / 治癒率 a cure rate.
ちゅう[1] 中 ¶中ぐらいの middling; medium; mediocre / 中以上になる[以下に下がる] rise above [fall below] the average.
ちゅう[2] 宙 〈空間〉 space; 〈大空〉 the air; 〈中空〉 midair ¶宙にぶら下がる hang [be suspended] in midair / 宙を踏んで歩くような気持ちである be [feel as if *one* is] walking on air / 宙に浮いている be floating in the air;

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perience he came up with an excellent idea.
ちゃくよう 登校の際は制服着用のこと. Students must attend school in uniform. / 当日は礼服着用のこと. 〈案内状などで〉 Evening dress. | Dress: Formal.
ちゃくりく 次の着陸予定地はサンフランシスコだった. The next scheduled stop was San Francisco.
ちゃっかり あいつ, ちゃっかりしてるなあ. He's got a nerve [《英》 cheek].
チャック その上着はボタン式ですかチャック式ですか. Does the jacket button or zip?
ちゃのま 色々のものがテレビを通じて直接茶の間に入りこむ. A lot of things come straight into your living room via television.
ちゃんと 部屋はちゃんと片づいている. The room is (kept) very tidy. / 用意はちゃんと出来ている. We are quite ready. | 〈万事〉 Everything is ready. / 切符はちゃんと買ってある. I've got my ticket all right. / ちゃんと机の上に置いたんだ. I am sure I put it on the desk. / 彼は家賃を月々ちゃんと払う. He pays his rent regularly every month. / あの男は家庭生活がちゃんとしていない. His home life isn't all that it ought to be.
チャンネル 第3チャンネルで何かいい番組をやっているそうだ. I hear there's something good on Channel 3. / そのチャンネルははっきり出なかった. Reception of that channel was poor. / うちでは子供がチャンネル権を握って

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